

Water Supply Workshop



November 1, 2004

Sonoma County Water Agency

Staff Report

Introduction

Starting in the 1950s, the Sonoma County Water Agency's (Agency) water supply role was principally to serve as the local sponsor of federal flood control and water supply projects and to develop a system of pumps, tanks and pipes to serve surface water to its municipal customers. Today, the water supply picture is more complex and presents new challenges. Although surface water and groundwater will continue to remain the primary sources of water in the Agency's service area, recycled and conserved water have begun to offset surface and groundwater use and will provide a critical component of the water supply picture in the 21st century. These four sources of water are interrelated; use of one reduces the need for the others. The purpose of this report is to update the Board and the public on the Agency's water supply activities—those related to all four sources of water—and to provide the opportunity for the Board of Directors (Board) to discuss the Agency's direction. Following the Workshop, the Agency General Manager/Chief Engineer will return to the Board at a regular Board meeting for specific direction.

This staff report presents the following:

Section 1.0 provides background information regarding the Russian River water supply and transmission system facilities including the Potter Valley Project (owned and operated by Pacific Gas and Electric), the Russian River Project (Coyote Valley Dam and Warm Springs Dam), and the Agency's water transmission system;

Section 2.0 describes the connection between groundwater and Russian River resources in addition to discussing ongoing and proposed groundwater studies in which the Agency is involved. Possible future activities for the Board to consider related to groundwater management strategies are also discussed;

Section 3.0 provides information regarding existing and planned Agency recycled water projects and how such projects can reduce demands on groundwater and Russian River resources;

Section 4.0 presents information regarding ongoing water conservation programs conducted by the Agency and its contractors and describes future measures that could be implemented to achieve further savings, especially during periods of peak water demand.

Section 5.0 presents the results of a preliminary analysis of the reliability of the Agency's transmission system to provide water, under the Agency's existing water rights, to Agency customers during 7-day peak demand periods, typical of a heat wave;

Section 6.0 provides the rationale for a proposed new water project and corresponding environmental impact report, for the Board's consideration. This project would address the current transmission system reliability issues described in Section 6.0 in addition to providing a reliable water supply for future needs in the Agency's service area;

Section 7.0 summarizes the status of several water supply agreements that the Agency is working on to support the overall efforts described in the preceding sections of this staff report.

1. Russian River Water Supply and Transmission System Facilities

The Sonoma County Water Agency is the wholesale provider of potable water for approximately 570,000 people in Sonoma and Marin counties. Since its creation in 1949, the Agency's primary responsibilities as a water supplier include operation of the federal Russian River Project and the Agency's water transmission system. The Russian River Project consists of Coyote Valley Dam, which creates Lake Mendocino and Warm Springs Dam, which creates Lake Sonoma on Dry Creek, a Russian River tributary (Figure 1). The Agency manages the water supply in both reservoirs, while the United States Army Corps of Engineers (USACE) controls flood control releases from the reservoirs. The Agency also manages non-flood control releases to maintain required minimum flows in the Russian River and Dry Creek. The Agency diverts and delivers water to its wholesale customers through its transmission system, consisting of diversion facilities, treatment facilities, pipelines, water storage tanks, booster pump stations, and groundwater wells. The Agency's prime water customers include the cities of Cotati, Petaluma, Santa Rosa, Rohnert Park, and Sonoma, and the Forestville, North Marin, and Valley of the Moon water districts ("water contractors"). In addition to water contractors, the Agency serves water to the following customers: the City of Healdsburg, the Town of Windsor, the Russian River County Water District, Camp Meeker Recreation and Park District, and the Occidental Community Services District. The sections below describe the components of the Russian River Project and the Agency's Transmission System facilities.

The Potter Valley Project and the Russian River Project

The Russian River originates in central Mendocino County, approximately 15 miles north of Ukiah (Figure 1). It drains an area of 1,485 square miles including much of Sonoma and Mendocino Counties. The river empties into the Pacific Ocean at Jenner in Sonoma County, about 20 miles west of Santa Rosa. The main channel of the Russian River is about 110 miles long and flows generally southward from its headwaters near Redwood and Potter Valleys, to Mirabel Park, where the direction of flow changes to generally westward as it crosses the Coast Range. Principal tributaries of the Russian River are the East Fork of the Russian River, Big Sulphur Creek, Mark West Creek, Maacama Creek, Dry Creek, and Austin Creek.

Three major reservoirs provide the summer water supply for the Russian River watershed: Pacific Gas & Electric Company's Lake Pillsbury on the Eel River, Lake Mendocino on the East Fork Russian River, and Lake Sonoma on Dry Creek. Lakes Mendocino and Sonoma and their associated dams and facilities are referred to as the "Russian River Project."

Lake Pillsbury and The Potter Valley Project

Water is released from Lake Pillsbury to the Eel River, and then re-diverted 12 miles downstream at Cape Horn Dam to the Potter Valley Power Plant through the diversion tunnel. The water then flows through the East Fork of the Russian River to Lake Mendocino. Since 1908, diversions from the Eel River have been used to generate power, irrigate agricultural land in Potter Valley, and augment summer flows in the Russian River.

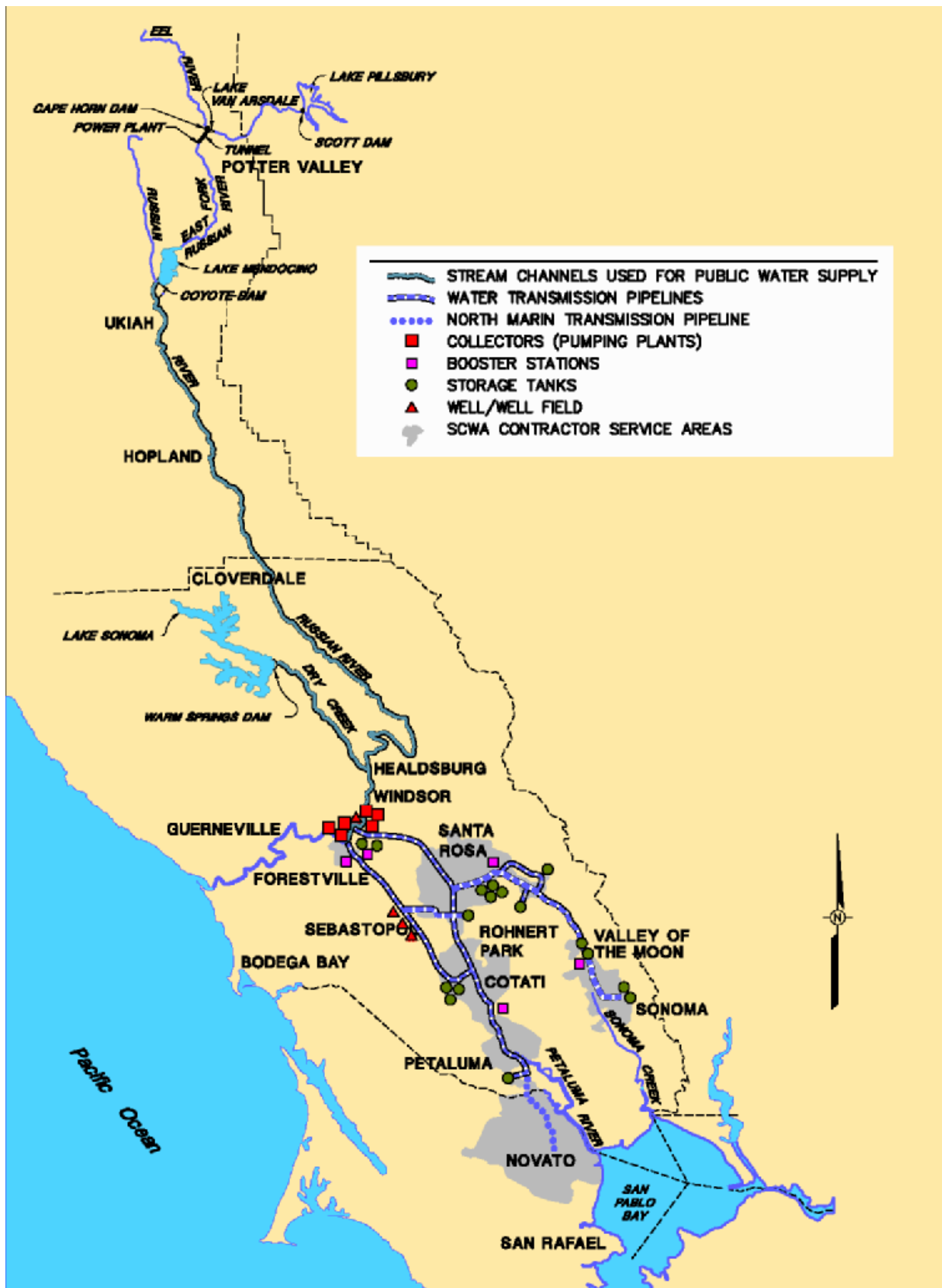


Figure 1: Overview of Russian River and Transmission System Facilities

Lake Mendocino and Coyote Valley Dam

Lake Mendocino, located 3 miles east of the City of Ukiah, is created by Coyote Valley Dam, located on the East Fork of the Russian River, 0.8 mile upstream of the East Fork's confluence with the Russian River (Figure 1).

Lake Mendocino, which began storing water in 1959, has a design capacity of 122,500 acre-feet at the spillway crest elevation of 764.8 feet above mean sea level (MSL), and captures runoff from a drainage area of about 105 square miles. The design water supply pool capacity of Lake Mendocino is 72,000 acre-feet. The Agency and the Mendocino County Russian River Flood Control and Water Conservation Improvement District have water right permits authorizing the storage of up to 122,500 acre-feet per year in the reservoir. Because the Water Agency is the local sponsor of the Coyote Valley Dam Project, it has the exclusive right to control releases from the water supply pool in Lake Mendocino. When the water level rises above the top of the water supply pool (elevation 737.5 feet above MSL) and into the flood control pool, the USACE assumes control of releases.

During the rainy season (November through May), natural streamflow (rather than reservoir releases) accounts for most of the flow of the Russian River. From June through October, most of the water in the Russian River downstream of Coyote Valley Dam and above Dry Creek is water that was released from storage at Lake Mendocino.

Lake Sonoma and Warm Springs Dam

Lake Sonoma, located about 5 miles southwest of the City of Cloverdale, is created by Warm Springs Dam, located on Dry Creek, about 11 miles upstream of Dry Creek's confluence with the Russian River (Figure 1). Warm Springs Dam is a rolled earth embankment dam with a crest elevation of 495 feet above MSL. Lake Sonoma, which began storing water in 1983, has a design capacity of 381,000 acre-feet at the spillway crest elevation of 495 feet above MSL, and captures runoff from a drainage area of about 130 square miles. The design water supply pool capacity of Lake Sonoma is 245,000 acre-feet.

During the dry season (May through October), natural streamflow (rather than reservoir releases) accounts for very little of the flow in Dry Creek. Most of the water present in Dry Creek during this time period results from the Agency's water supply releases from Warm Springs Dam. Water supply releases from Lake Sonoma are used to meet minimum instream flow requirements and municipal, domestic, and industrial demands in the lower Russian River area and portions of Sonoma and Marin counties. To meet these demands, water released from Lake Sonoma combines with releases from Coyote Valley Dam and runoff from other tributaries. A portion of this water is re-diverted at the Agency's diversion facilities near Forestville.

Water Transmission System

The Agency's water transmission system conveys potable water to the Agency's contractors and customers. The transmission system consists of pipelines (also referred to as aqueducts), storage tanks, booster pump stations, and other facilities. Potable water is delivered through the transmission system to contractors and customers by metered turnouts along the pipelines into the contractors' and customers' own distribution systems

of pipelines and tanks. The Agency operates the transmission system by maintaining a sufficient volume of water in its storage tanks (distributed throughout the transmission system) and by pumping water from its Russian River diversion facilities and wells. The Agency must maintain sufficient water levels in its storage tanks so that there are adequate flows and pressures to meet contractor and customer water supply demands.

As shown in Figure 1, the transmission system extends from the Agency's Russian River diversion facilities located near Forestville to the Santa Rosa, Petaluma and Sonoma Valleys. A pipeline owned and operated by the North Marin Water District is connected to, and receives water from, the transmission system near the Kastania Tanks located near the border of Marin County with Sonoma County. The major pipelines that comprise the system are identified in Figure 2 and are known as the Santa Rosa Aqueduct (built in 1959), the Sonoma Aqueduct (built in 1963), the Petaluma Aqueduct (built in 1964), and the Russian River to Cotati Intertie (built in 1977). The transmission system improvement projects that are currently being designed or constructed include Collector No. 6, the Wohler to Forestville pipeline, the Eldridge to Madrone Pipeline, and Kawana Tank No. 2. When these projects are complete, the transmission system will consist of over 85 miles of pipelines that range in diameter from 8 to 54 inches, 7 booster pump stations, and 17 storage tanks with a combined storage capacity of 128.8 million gallons.

2. Groundwater

Groundwater is another important source of water in Sonoma County because it represents the domestic water supply for most of the unincorporated portion of the County, in addition to being the primary source of water for agriculture. Groundwater provides an important portion of the water supply for many of the Agency's contractors, including the cities of Sonoma, Cotati, Rohnert Park, and Petaluma and the Valley of the Moon Water District. The City of Sebastopol also utilizes groundwater in or adjacent to the Santa Rosa Plain to provide all of its water supply. The Agency also relies on groundwater to supplement its Russian River water supply.

Groundwater resources in many areas of the county are affected by water delivered through the surface water delivered through the Agency's water transmission system (Figure 2). Since the late 1950s, the Agency has provided potable water (primarily from the Russian River) to meet the water supply needs of its contractors. The Agency's transmission system has allowed land use planners in the county to focus growth in urban centers, while maintaining open space and agriculture. This use of Russian River water has reduced the need for groundwater for municipal water supply in many areas of the county. For example, Figure 3 illustrates the relationship between groundwater and Russian River water supplies for the southern Santa Rosa Plains area, including the following information from 1971 to 2004: (1) the cumulative groundwater pumping of the Cities of Rohnert Park and Cotati; (2) the amount of water provided to the Cities of Rohnert Park and Cotati from the Agency's transmission system; and (3) the typical water level response from a representative monitoring well in the area. As shown in Figure 3, the increase of groundwater pumping through the mid 1980s resulted in a decline of groundwater levels. Since the mid-1980s, this area has received a significant increase of water from the Agency's transmission system, which has resulted in stabilized and possibly slightly rebounding groundwater levels in recent years. The impact on groundwater from water deliveries from the Agency's water transmission system will continue into the future, and will be affected by limitations in Russian River water supply or transmission system capacity.



Figure 2: Sonoma County Water Agency Transmission System

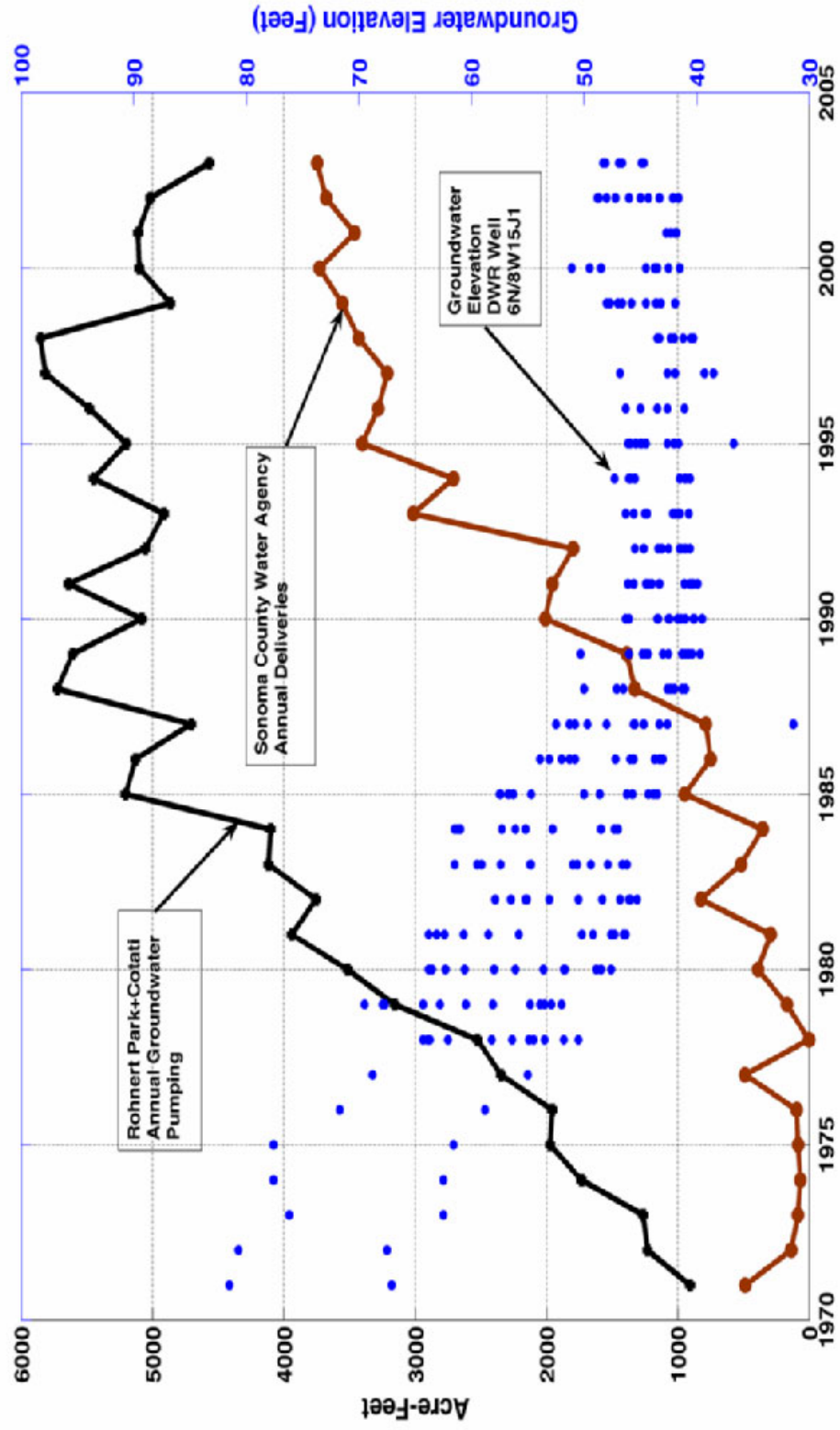


Figure 3: Correlation of Groundwater Pumping, Agency Transmission System Deliveries, & Typical Groundwater Levels in the Southern Santa Rosa Plains Area

The most recent comprehensive scientific assessment of groundwater resources in Sonoma County was performed between 1975 and 1982 by the California Department of Water Resources (DWR) in cooperation with the Agency. This assessment was conducted by performing a series of studies documented in DWR Bulletin 118-4. Although DWR was directed to update Bulletin 118 (including 118-4 for Sonoma County) by legislative authorization in the State's Fiscal Year 1999/2000 Budget, this update was limited to a brief summary compilation of existing information due to state funding constraints.

Given the changes in land use and population that have occurred over that past 20 to 25 years, information regarding groundwater resources in Sonoma County is outdated and not representative of current conditions. To address this issue, on January 25, 2000 the Agency's Board directed staff to develop a work program to evaluate groundwater resources in Sonoma County.

Agency/USGS Evaluation of Groundwater Basins

Agency staff worked with scientists from the U.S. Geological Survey (USGS) to develop a cooperative study work program to systematically evaluate groundwater resources within the county's major groundwater basins (the Sonoma Valley, Alexander Valley, Santa Rosa Plain, and Petaluma Valley basins). Funding for the cooperative study is provided by the USGS, Agency, and other local stakeholders. The overall program was developed to be implemented in sequential phases as funding allows. In addition, each phase of work is reevaluated on a yearly basis with the Agency's Board and the USGS to determine funding levels for that year.

The cooperative study program is intended to enhance the current knowledge of groundwater resources within Sonoma County, and to provide an objective, comprehensive, and scientifically based evaluation of groundwater conditions in the four major groundwater basins. More specifically, the program is intended to:

- Provide a general characterization of groundwater resources and demand for groundwater in significant groundwater basins within the county.
- Update DWR Bulletin 118-4 describing general groundwater conditions in the largest groundwater basins within Sonoma County.
- Develop conceptual models for selected groundwater basins within the county that describe the basin limits, regional aquifer groundwater yield and storage, areas of recharge and discharge, and regional groundwater quality.
- Develop computer models for selected groundwater basins that can be used as planning tools to: (1) assess the impacts of future groundwater use scenarios; (2) assist in evaluating the hydrogeologic and water quality impacts to groundwater due to changing land use; (3) estimate groundwater recharge; and (4) evaluate surface water/groundwater interaction.
- Identify regional areas where groundwater resources are (or in the future may be) threatened due to overdraft and/or poor water quality.

- Evaluate the relationship between the significant groundwater basins within the county and with water supplies from the Russian River.

Ongoing Groundwater Basin Studies in Sonoma and Alexander Valleys

The initial phase on this program was initiated in 2001 and consists of a 4-year study of the Sonoma and Alexander Valley groundwater basins. The total estimated cost of this study is \$1,161,500, with the Agency and the USGS funding \$686,500 and \$475,000 of this total, respectively. The Agency and USGS seek funding on a yearly basis from their respective funding authorities. Agency staff plans to request that the Board authorize funding for the final year of the study in November 2004.

Possible Future Activities

Possible future activities that the Board could direct staff to pursue related to additional groundwater studies and management strategies include:

Potential Future Studies

Agency staff has worked with the USGS and other parties¹ to develop a similar basin-wide groundwater study for the Santa Rosa Plain groundwater basin. The estimated cost for the proposed five-year study is \$1,975,000, of which the USGS may contribute \$500,000. Agency staff developed a draft cooperative agreement that is currently under review by the staff from the other parties. Prior to commencing the study, the cooperative agreement will have to be approved by the respective governing board or funding authority for each participating party. A similar groundwater study could also be developed for the Petaluma Valley in the future.

Potential Sonoma Valley Groundwater Management Program

As mentioned above, the Agency/USGS study of the Sonoma Valley Groundwater Basin is expected to be completed in the fall of 2005. The preliminary results of the study indicate that the Sonoma Valley Groundwater Basin is limited in its water-bearing capacity due to its geology (generally fine grained sediments) and the relatively small size of the basin. In addition, the basin is bounded to the south by saline water (San Pablo Bay) which could intrude into the basin. Although there do not appear to be regional overdraft issues, there are indications of localized water level declines. The basin is vulnerable to potential water quality degradation from saline water intrusion and localized overdraft if conditions are not carefully monitored or managed in the future given the increasing significance of groundwater for meeting domestic, municipal, and agricultural water supply demands in the Sonoma Valley. Based on these issues, groundwater management, as discussed below, could be a method to help ensure a reliable supply in the Sonoma Valley.

Sonoma Valley Groundwater Management Objectives

Continued monitoring combined with optimizing use of the different available water sources in the Sonoma Valley can ensure that water users' needs are met and the overall

¹ The Cities of Rohnert Park, Cotati, Santa Rosa, Sebastopol, Town of Windsor, County of Sonoma, and CalAmerican Water Company.

reliability of the water supply increased and then maintained. The long-term water management strategy for the Sonoma Valley requires balancing the four available sources of water in the valley. The sources of water are:

- potable water supplied by the Agency from the transmission system;
- recycled water produced by the Sonoma Valley County Sanitation District;
- conserved water; and
- local groundwater that is pumped by both municipal suppliers and agricultural users.

If projects are implemented that increase the availability of Russian River water or provide recycled water for vineyard irrigation, current municipal and agricultural groundwater pumping can be reduced. By reducing the pressure on local groundwater supplies through continued and expanded water conservation programs and recycled water use, in addition to providing additional Russian River supplies (as available) to increase reliability for municipal users, the Sonoma Valley Groundwater Basin can be better maintained as a long-term reliable water supply.

Groundwater Management Planning

Throughout California, local agencies are turning to groundwater management planning as a key strategy in meeting local water supply needs. The State promotes this strategy by providing funds to assist in conducting necessary investigations and developing monitoring tools, developing groundwater management plans, and constructing recharge and reliability projects.

Local agencies that adopt groundwater management plans increase their prospects for receiving state grant funds for their projects (e.g., from, for example, Proposition 50). Under state law, a groundwater management plan must include certain specific components, but is not required to prohibit or regulate groundwater pumping. A groundwater management plan must, for example, identify basin management objectives and include mechanisms to monitor groundwater conditions. The Water Code requires public, local agency and stakeholder involvement when developing groundwater management plans. Such involvement is critical to the success of plan implementation.

A comprehensive groundwater management plan was recently adopted by the Sacramento Groundwater Authority to manage the Sacramento region's North Area Groundwater basin, which underlies a region of about 548 square miles. Although the participants are committed to not exceeding the sustainable yield of the basin, their groundwater management plan identifies cooperative rather than regulatory efforts. Generally, the participants expect, in wet years, to increase surface water use, reduce groundwater extraction and promote basin recharge and, in dry years, to increase groundwater use, reducing use of surface water. Demand reduction through increased water conservation and recycling are also components of the Sacramento groundwater management plan.

Grant Funding Opportunities

Under Proposition 50, passed by the voters in November 2002, groundwater management and recharge projects and projects with potential for groundwater improvement are given

funding priority if the agencies requesting the funding have developed a groundwater management plan for the area, or are developing a plan. In addition, under the State's Local Groundwater Assistance Program, grants of up to \$250,000 are available and under state selection criteria, applicants with groundwater management plans or that are developing groundwater management plans are rated higher when scoring projects for funding.

Staff Recommendation

Agency staff recommends that the Board authorize the Agency's General Manager/Chief Engineer to prepare a work plan for Board consideration detailing the steps necessary to develop a groundwater management plan for the Sonoma Valley.

3. Recycled Water Projects

The Agency is currently working with various entities to investigate the feasibility of projects that use recycled wastewater for beneficial purposes. Recycled water presents a viable and beneficial option to offset existing use of potable water supplied by groundwater resources and the Agency's transmission system. Ongoing recycled water efforts of the Agency and its contractors are discussed below.

North Sonoma County Agricultural Reuse Program

The Agency, in its continuing efforts to develop a recycled water supply for agricultural water users in the Russian River, Alexander, and Dry Creek valley areas (North Sonoma County area) has identified up to 25,000 acres of agricultural lands that could potentially use recycled water. Based on this estimate, staff is developing the North Sonoma County Agricultural Reuse Project (NSCARP). The NSCARP would include storage reservoirs, conveyance and distribution pipelines, and pump stations in the North Sonoma County area. The water for NSCARP would be tertiary-treated municipal wastewater conveyed primarily through the City of Santa Rosa's Geysers Pipeline.

Two local groups, the Coalition for Sustainable Agriculture (CSA) and the Dry Creek Agricultural Water Users, Inc. (DCAWU) have expressed significant interest in participating in a recycled water project to develop alternative sources of water for existing agricultural use. The CSA and the DCAWU both recognize that environmental demands for water within the Russian River watershed will compete with agriculture and other users. The CSA and the DCAWU also recognize that the agricultural use of recycled water may benefit the environment, and consider NSCARP to be part of a regional water supply solution that balances the needs of municipalities, agricultural interests, and the environment.

Presently, agricultural entities divert water directly from the Russian River and its tributaries, from the underflow of the Russian River and its tributaries, and from groundwater wells. The Agency expects that concerns of federal and state regulatory agencies regarding potential impacts to fishery resources within the Russian River watershed may result in increasing limitations on diversion of water within the watershed.

The purpose of the NSCARP is to provide a reliable alternative source of agricultural water to reduce reliance on natural regional water supplies and address regional water supply and regulatory issues.

Sonoma Valley Recycled Water Project

To promote the use of recycled water, the Sonoma Valley County Sanitation District (SVCSD), in conjunction with the Valley of the Moon Water District (VOMWD), and the City of Sonoma, is studying the feasibility of alternatives to store and supply recycled water to potential users within the Sonoma Valley. The objectives of the feasibility study are to: (1) evaluate the feasibility (technical and economic) of expanded use of recycled water in Sonoma Valley; (2) evaluate potential water supply, environmental, and economic benefits for stakeholders (VOMWD, City of Sonoma, SVCSD, agricultural interests); and (3) complete a long-term planning document designed to identify or develop a phased program.

The VOMWD and City of Sonoma rely on both the Russian River watershed and local groundwater for potable water use. There are several constraints on water supply in the Sonoma Valley. These include: (1) constraints in the capacity of the Sonoma Aqueduct, which limit the Agency's ability to meet peak summer demand of the VOMWD and the City of Sonoma; (2) increased groundwater use (either for potable water supply or agricultural purposes) is apparently creating stressed aquifer conditions in some areas of the Sonoma Valley; and (3) increased environmental regulatory requirements and constraints are increasing operational costs for the SVCSD and lead to concerns about the viability of continued discharge in the future.

To address these issues, the VOMWD, the City of Sonoma, and the Agency have identified the potential use of recycled water as an option to offset water use demands in the Sonoma Valley. The increased use of recycled water within the Valley can assist in: (1) offsetting potable water use in the VOMWD and the City of Sonoma; (2) potentially decreasing agricultural groundwater use, thus allowing more groundwater resources to be used for domestic supply; and (3) potentially reducing or eliminating discharges from the SVCSD treatment plant to waters of the United States, an environmental benefit.

Other Agency Recycled Water Use

In addition to the two projects listed above, the Agency has an extensive recycled water program throughout its service area. For example, the Agency operates an aggressive recycled water program at both its Airport Treatment Plant and the SVCSD facility. At both facilities, recycled water is used by local agricultural operations to offset existing groundwater and surface water use. The Agency has also funded a recycled water project in the Forestville area to offset existing potable water from the Agency's transmission system used to irrigate a youth park and two local schools. As identified, the Agency continues to seek additional opportunities to maximize the potential to offset existing water use through the beneficial use of recycled water.

Local Supply/Recycled Water/Tier 2 Water Conservation Funding Program

As formalized in the MOU regarding Temporary Impairment, the Agency, in conjunction with its water contractors, the Town of Windsor, and the Marin Municipal Water District (MMWD) developed the Local Supply/Recycled Water/Tier 2 Water Conservation

Funding Program (LRT2 Program). Under this program, the Agency plans to appropriate and distribute funds to the retail water agencies for implementing additional water conservation measures, developing recycled water projects that offset potable water use, and developing standby local peak-month production capacity that reduces demand on the Agency's water transmission system. The Agency and its retail water agencies agreed to co-fund an additional \$13 million over a 10-year period beginning in FY 2001-02 to share in the cost of LRT2 program implementation. To date, several projects have received funding under this program, including two projects discussed below that reduce demand on the Agency's transmission system.

City of Petaluma

The City of Petaluma is constructing a pipeline to convey recycled water to Rooster Run Golf Course. Upon completion of the Project, the pipeline will save 110 million gallons of potable water annually. The project will reduce impact on the Agency's water transmission system by delivering high-quality recycled water for irrigating the turf and landscape plants at the Rooster Run Golf Course. The project will offset potable water use and reduce peak demands on the Agency's water transmission system.

Town of Windsor

The Town of Windsor is constructing the Sonoma County Airport Recycled water Project, a multi-phased project consisting of installation of up to 35,000 feet of recycled water mains and 50 or more water services in the non-residential area known as the Sonoma County Airport Industrial Area. Upon completion of all phases of the Project, 100 to 120 million gallons of water are expected to be saved annually from the Agency's Santa Rosa Aqueduct. As with the Petaluma project, this project will also reduce peak demands on the Agency's water transmission system.

4. Water Conservation

Water conservation has had a central role in the Agency's water supply planning since 1981 when the Agency hired its first full time water conservation coordinator. The program, based on implementation of cost-effective conservation methods, currently achieves annual water savings of about 3,755 acre-feet per year and is on track to meet a goal of saving 6,600 acre-feet per year by 2015. Some of the retail water contractors exhibit excellent performance in water conservation as indicated by their Best Management Practices (BMP) performance reports. As discussed below, opportunities exist to expand water conservation programs through development of new best management practices and implementation of new water conservation technology emerging at this time. Water conservation can reduce peak demand on the Agency's transmission system and offset groundwater pumping.

Regional Program Plan

The Agency completed development of a long-term Water Conservation Plan in 1998. The plan identified specific actions to be taken by the Agency and by the water contractors to implement listed water conservation measures that would achieve a goal of conserving 6,600 acre-feet of water per year by 2015. The document also included a 10-year water conservation financial plan and designated specific water conservation goals for each of the water contractors as shown in Table 1, below.

TABLE 1
WATER CONTRACTOR CONSERVATION GOALS AND FUNDING

Contractor	Conservation Goal (acre-feet / year)	Total Funding
City of Santa Rosa	2,500	\$6,037,344
North Marin Water Dist.	1,200	\$2,925,311
City of Petaluma	1,000	\$2,780,083
City of Rohnert Park	1,400	\$1,556,017
Valley of the Moon WD	200	\$663,900
City of Sonoma	200	\$622,407
City of Cotati	80	\$315,353
Forestville WD	20	\$99,585
TOTAL	6,600	\$15,000,000

The goal to conserve 6,600 acre-feet per year of water was derived from analysis contained in Agency planning and CEQA documents from the mid-1990s and is targeted to achieve cost-effective water savings.

Participation by Water Retailers

The Agency and the water contractors implement the water conservation plan. Expenditures under the water conservation financial plan, as shown in Table 2, began in fiscal year 1998-99 and now total \$8,673,239 or 58% of available funding. When remaining fiscal year 2004-05 contracts are finalized the total expenditures are expected to closely match the projected amounts for year seven of the program.

TABLE 2
Water Conservation Expenditures Under the Water Conservation Plan

Fiscal Year	Santa Rosa	North Marin	Petaluma	Rohnert Park	Valley of the Moon	Sonoma	Cotati	Forestville	Total
1998/99	603,734		147,000	457,600	120,000				1,328,334
1999/00		250,000	25,000	351,200					626,200
2000/01	1,207,468	311,000	389,000		60,000	124,000		99,585	2,191,053
2001/02	603,734	292,000	278,000	25,000	60,000	124,000	63,000		1,445,734
2002/03	603,734	349,000	278,000	155,601	66,390		63,000		1,515,725
2003/04	603,734	349,000				62,241			1,014,975
2004/05			332,617	155,601			63,000		551,218
TOTAL	3,622,404	1,551,000	1,449,617	1,145,002	306,390	310,241	189,000	99,585	8,673,239

Eleventh Amended Agreement's Water Conservation Requirement

The Eleventh Amended Agreement for Water Supply, finalized in 2001, required the water contractors to implement or use their best efforts to secure implementation of the water conservation BMPs as established by the California Urban Water Conservation Council; or use their best efforts to secure implementation of alternative water conservation measures that achieve at least the same level of water savings.

The agreement also specifies that if the Water Advisory Committee, a committee composed of water contractor representatives, finds that any water contractor's compliance with water conservation practices is unsatisfactory that contractor shall bring its programs into compliance within six months. Should the noncompliance continue beyond the time period allowed by the Water Advisory Committee, then that contractor must pay a ten percent surcharge on the Operation and Maintenance charge for all water delivered by the Agency until the Water Advisory Committee determines that the water contractor is in compliance. Based on current Operation and Maintenance charges, the ten percent surcharge would be about \$34 additional per acre foot.

Memorandum of Understanding Regarding Temporary Impairment

The Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment (MOU), finalized in 2001, required the Agency and the water contractors to take additional steps beyond those outlined in the Eleventh Amended Agreement to implement water demand reduction measures. Ten retail water contractors, including all of the Agency's contractors agreed to sign the Memorandum of Understanding Regarding Urban Water Conservation in California as prepared by the California Urban Water Conservation Council (CUWCC) and thereby commit to implement the Council's BMPs for water conservation. The contractors fulfilled this requirement to sign the CUWCC MOU as shown in Table 3. The CUWCC MOU currently identifies 14 BMPs as listed in Table 4, below. (The Agency signed the CUWCC MOU on June 1, 1998.)

<u>TABLE 3</u>	
Retail Agency and Signatory Year for CUWCC MOU	
Name of Retail Agency (abbreviation)	Year Signed CUWCC MOU
Marin Municipal Water District (MMWD)	08/29/1991
City of Santa Rosa (Santa Rosa)	05/05/1998
Town of Windsor (Windsor)	08/09/1999
Forestville Water District (Forestville)	05/01/2001
North Marin Water District (NMWD)	07/05/2001
City of Cotati (Cotati)	07/11/2001
Valley of the Moon Water District (VOM)	10/01/2001
City of Sonoma (Sonoma)	01/18/2002
City of Petaluma (Petaluma)	01/31/2002
City of Rohnert Park (Rohnert Park)	06/12/2002

TABLE 4
CUWCC Best Management Practices for Water Conservation

BMP 1	WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS
BMP 2	RESIDENTIAL PLUMBING RETROFIT
BMP 3	SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR
BMP 4	METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS
BMP 5	LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES
BMP 6	HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS
BMP 7	PUBLIC INFORMATION PROGRAMS
BMP 8	SCHOOL EDUCATION PROGRAMS
BMP 9	CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CII) ACCOUNTS
BMP 10	WHOLESALE AGENCY ASSISTANCE PROGRAMS
BMP 11	CONSERVATION PRICING
BMP 12	CONSERVATION COORDINATOR
BMP 13	WATER WASTE PROHIBITION
BMP 14	RESIDENTIAL ULFT REPLACEMENT PROGRAMS

The CUWCC sets timetables and specific standards for implementation of each BMP. Each contractor must report performance on each BMP annually using an online data entry system. The CUWCC also provides standard procedures to estimate actual water savings based on BMP performance reports.

In the MOU for Temporary Impairment, all the water contractors and the Town of Windsor agreed to accelerate implementation of BMP #5 for large landscape water conservation measures by July 1, 2001. (Marin Municipal had already implemented these measures.) Various other specific measures were identified for implementation by each water customer and contractor signatory to the MOU.

Present Status of Water Conservation Programs

Agency staff assesses the performance of water conservation programs based on the standardized reports of BMP implementation filed with CUWCC by each water contractor. This allows the Agency to determine relative progress of each contractor toward compliance and to estimate actual water savings based on criteria established by CUWCC in a consistent manner.

The current status of BMP implementation by the water contractors is shown in TABLE 5 which indicates, for each contractor and for each BMP, whether that contractor is “on track” or if the BMP requirement is “unmet”. Table 5 also shows preliminary estimates of program performance using a weighted scoring system described under staff recommendations below.

TABLE 5
WATER CONSERVATION PROGRAM
BMP IMPLEMENTATION STATUS AND PRELIMINARY WEIGHTED SCORES FOR EACH WATER CONTRACTOR
Current through June 30, 2004

	Santa Rosa	Petaluma	North Marin	Rednet Park	Sonoma	Valley of the Moon	Cotati	Forestville (b)	Marin Municipal	Windsor (c)	SCWA
Program Evaluation: Preliminary Weighted Score (a)											
BMP 1 - Water Survey Program for Residential Customers (15%)	95%	70%	90%	65%	65%	65%	48%	45%	95%	63%	n/a
BMP 2 - Residential Plumbing Retrofit (10%)	ON TRACK	UNMET	ON TRACK	UNMET	UNMET	UNMET	UNMET	UNMETb	ON TRACK	UNMET	n/a
BMP 3 - System Water Audits, Leak Detection, and Repair (10%)	ON TRACK	UNMET	ON TRACK	UNMET	UNMET	UNMET	UNMET	UNMETb	ON TRACK	UNMET	n/a
BMP 4 - Metering with Commodity Rates (2.5%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK
BMP 5 - Large Landscape Conservation & Incentives (15%)	UNMET	UNMET	UNMET	UNMET	UNMET	UNMET	UNMET	UNMETb	UNMET	UNMET	n/a
BMP 6 - High Efficiency Washing Machine Rebate (2.5%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	n/a
BMP 7 - Public Information Programs (2.5%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK
BMP 8 - School Education Program (2.5%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK
BMP 9 - Conservation Program for CII Accounts (10%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	UNMET	ON TRACK	ON TRACK	UNMET	n/a
BMP 11 - Conservation Pricing (15%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK
BMP 12 - Conservation Coordinator (2.5%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	UNMET	ON TRACK	ON TRACK	ON TRACK
BMP 13 - Water Waste Prohibition (2.5%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	UNMET	ON TRACK	ON TRACK	n/a
BMP 14 - Residential Toilet Replacement Program (10%)	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	ON TRACK	UNMETb	ON TRACK	ON TRACK	n/a

(a) Preliminary weighted performance score based on weighting factors as indicated adjacent to each BMP.

(b) Forestville Water District applied for an exemption.

(c) Windsor has required ULFTs in all new construction since 1986, and has retro-fitted 375 pre-1986 connections.

ON TRACK = Retailer is on tract to meet the 10-year requirement. This is determined if retailer meets CUWCC MOU minimum condition requirements.

UNMET = Retailer is not on tract to meet the 10-year requirement. This is determined if the retailer does not meet CUWCC MOU minimum condition requirements.

The table indicates solid progress toward meeting most of the BMPs. However, the table also indicates that performance lags on BMP 1, BMP 2, and especially BMP 5. Petaluma, Cotati, Rohnert Park, Sonoma, Valley of the Moon Water District, Forestville and Windsor do not meet CUWCC criteria for BMP 1, residential water use surveys, or CUWCC criteria for BMP 2, residential plumbing retrofit (i.e., shower and faucet flow restriction devices). Due to a revision in the reporting standards for BMP 2 most customers are expected to achieve compliance with BMP 2 in the next reporting period.

None of the customers or water contractors reported compliance with BMP 5 regarding large landscape conservation measures. Failure to comply with BMP 5 is of particular concern since these water purveyors agreed to accelerate implementation of BMP 5 under the MOU for Temporary Impairment, and because landscape water conservation measures contribute directly to reduction of peak demand on the Agency's transmission system.

Progress toward implementing other BMPs has been very strong as indicated by the large numbers of fixture replacements as shown in Table 6. These installations offer immediate water savings and continuing savings for years to come.

<u>TABLE 6</u> Water Conserving Fixture Replacements	
Fixture	Prime Retail Water Agencies Fixture Replacement
Residential ULF Toilets	110,350
Water Efficient Washing Machines	15,655
Commercial ULF Toilets	12,031
Commercial Restaurant Pre-rinse Valves	545

Sonoma County Water Agency Wholesaler Programs

The Agency provides \$1.5 million annually to support implementation of water conservation programs among the prime water contractors under the financial plan. The Agency also maintains a staff of five water conservation professionals who support the water contractors in implementing water conservation programs. These individuals currently support programs in Rohnert Park, Petaluma, North Marin Water District and City of Sonoma. In addition, staff implement various regional water conservation programs on behalf of the Agency and the water contractors including a water education program, a public information program, a high-efficiency washing machine rebate program, a restaurant pre-rinse valve replacement program, a commercial/institutional conservation program, and implementation of geographic information systems (GIS) technology for budgeting outdoor water use.

The 15,655 residential washing machines rebated under the Agency's regional residential clothes washing machine rebate program conserve approximately 80 million gallons (245 acre-feet per year) of water annually in the Agency's service area. Installation of 545

restaurant pre-rinse spray valves in local businesses using grant funds and at no cost to business owners conserve about 22 million gallons of water annually (68 acre-feet per year). Both programs facilitate installation of appliances that not only conserve water but also perform more effectively than conventional devices and are well-received by the users.

The Agency's water education program reached a total of about 30,000 students, teachers and parents in 2004 with classroom instructional programs, an outdoor education program, teacher workshops, distribution of educational materials and other activities. The Agency program follows state standards for science instruction, has received statewide and national recognition, and is in high demand among local schools with requests for service typically more than two times the current availability.

Water Conservation Results

The CUWCC guidelines provide a means to estimate actual water savings based on BMP implementation reports filed annually by each water contractor. These calculations indicate that the water contractors and customers have achieved water savings of about 3,755 acre-feet per year as shown in Figure 4. These water savings do not include water savings from landscape irrigation measures nor from the commercial food service sprayer valve replacement program which was aggressively implemented in 2003-04.

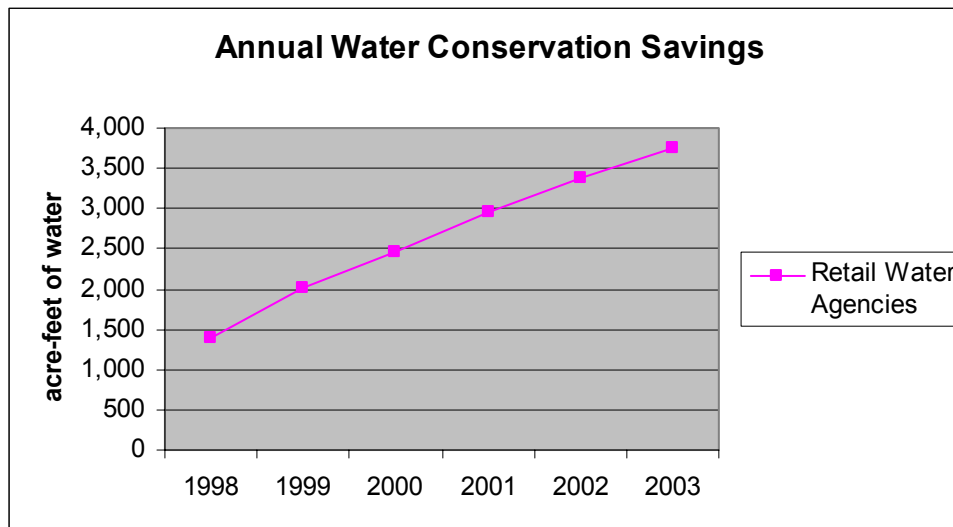


Figure 4: Annual Water Conservation Savings

Analysis of water savings by the prime water contractors indicates that the program is on track to meet its goal of saving 6,600 acre-feet of water per year by the year 2015.

Staff Recommendation for Water Conservation Programs

Review of the status of water conservation programs implemented by the Agency and by the water contractors indicates that strong water conservation programs have been established that are saving substantial amounts of water each year. However, assessment

of BMP performance also suggests that more can be accomplished within the framework of existing programs.

Staff recommend that the Board consider the following actions:

1. Direct the General Manager / Chief Engineer to implement a weighted scoring system to evaluate contractor performance under the BMPs for water conservation. A weighted scoring system could place greater emphasis on reducing peak demand, a key issue for the region.
2. Adopt a resolution or take other action to urge the Water Advisory Committee (WAC) to exercise authority to invoke a 10% surcharge on water supply operations and maintenance charges for contractors not satisfactorily implementing water conservation BMPs.
3. Direct staff to review and update current water conservation goals in consideration of anticipated findings of the Urban Water Management Plan (2005) and analysis of the cost-effectiveness of new and existing conservation technologies.
4. Direct staff to review emerging water conservation methods; identify those that offer cost-effective water savings in our region; and develop new programs based on the new technologies for Board consideration.

A discussion of each recommendation is presented below.

Prioritizing the BMPs to Address Peak Demands

Implementing BMPs that address peak demand in the summer months may be of more immediate benefit to the region than other BMPs for conservation, particularly given the 7-day peak demand problems described in Section 5 of this report. High summer water demand stresses the transmission system to near capacity and increases the amount of water that must be released from reservoirs for urban uses. Staff recommends that future evaluations of contractor BMP performance use a weighted scoring methodology that would give greater importance to BMPs targeted to reduce peak demand and secondarily to BMPs with the greatest potential to reduce overall demand. Proposed weightings to be applied to the BMPs for program evaluation, as shown in Table 7, were discussed with the WAC on October 4, 2004.

TABLE 7
Proposed Weighting Factors for Best Management Practices

	Description	% Weighting
BMP 1	WATER SURVEY PROGRAMS FOR SINGLE-FAMILY RESIDENTIAL AND MULTI-FAMILY RESIDENTIAL CUSTOMERS	15%
BMP 2	RESIDENTIAL PLUMBING RETROFIT	10%
BMP 3	SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR	10%
BMP 4	METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS	2.5%
BMP 5	LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES	15%
BMP 6	HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS	2.5%
BMP 7	PUBLIC INFORMATION PROGRAMS	2.5%
BMP 8	SCHOOL EDUCATION PROGRAMS	2.5%
BMP 9	CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL (CII) ACCOUNTS	10%
BMP 10	WHOLESALE AGENCY ASSISTANCE PROGRAMS	0%
BMP 11	CONSERVATION PRICING	15%
BMP 12	CONSERVATION COORDINATOR	2.5%
BMP 13	WATER WASTE PROHIBITION	2.5%
BMP 14	RESIDENTIAL ULFT REPLACEMENT PROGRAMS	10%

Agency staff prepared a preliminary scoring chart for the water contractors based on these weightings (See Table 5). The weighted scores provide a benchmark for comparison of contractor programs with respect to peak demand reduction and annual water savings and could be re-calculated annually to assess progress and prioritize future work in water conservation.

Water Rate Surcharges

The WAC has the authority to direct a contractor to bring its water conservation program into compliance within a specified time period or pay a surcharge of ten percent on the Operations and Maintenance charge for Agency-supplied water. A ten percent surcharge would typically be about \$34 per acre-foot above the prevailing operation and maintenance charge of about \$339 per acre foot. The Board could adopt a resolution or take other actions urging the WAC to implement surcharges for contractors with inadequate conservation programs.

Revised Conservation Goals

Agency staff and consultants are currently revising the regional Urban Water Management Plan on behalf of the Agency, and the prime water contractors, and the

Town of Windsor. Analysis of future water demand and assessment of additional, cost-effective, conservation potential may warrant revision of the existing water conservation goals. The Board may wish to direct staff to reevaluate the existing goals and develop new, more aggressive conservation targets based on information in the revised Urban Water Management Plan (anticipated to be completed in 2005).

New Technology

The CUWCC and other organizations are testing new water conservation technology that may warrant implementation in the form of additional BMPs. Agency staff work closely with the CUWCC in this effort and serve on the CUWCC board and on technical committees for this purpose. The Agency and the water contractors would be obligated to implement any new BMPs that are ultimately adopted by the CUWCC. However, if new technology or methods emerge that are of particular importance to Agency operations, the Board may wish to direct staff to implement cost-effective measures when identified without waiting for adoption by the CUWCC.

5. Water Supply Reliability: Evaluation of Short-Term Transmission System Operational Reliability

Agency staff has performed a preliminary engineering analysis of the operational reliability of the Agency's water transmission system. Based on this evaluation, Agency staff concluded that the transmission system cannot convey sufficient water to meet the near-term water supply needs of some transmission system water contractors and customers during an ordinary 7-day peak water demand period. To address this issue, staff conducted an analysis of the Agency's transmission system to determine areas of concern. In conducting the analysis, the Agency had the following objectives:

- To identify potential problems with the Agency's existing transmission system associated with meeting peak 7-day demands; and
- To identify areas within the Agency's transmission system that require near-term action to ensure a reliable water supply during peak 7-day demand periods.

The analysis did not evaluate the transmission system's ability to withstand natural hazards such as earthquakes, wildfires, or floods. The Agency is conducting a separate natural hazard reliability assessment as authorized by the Board on April 27, 2004.

The Russian River System and the Agency's water transmission system are described in Section 1 above. The following discussion describes: (1) the methodology used to evaluate the operational reliability of the transmission system; (2) key assumptions used in the analysis; (3) the findings of the evaluation; and (4) future activities that Agency staff will conduct to further evaluate the operational reliability of the water transmission system.

Modeling Methodology

Agency staff performed computer modeling of the water transmission system using WaterCAD version 6.5. WaterCAD is a water distribution modeling and management computer software package developed by Haestad Methods and is used by water suppliers throughout the world. The model was constructed based on as-built drawings of the Agency's water transmission system. Initial water levels in transmission system

storage tanks were selected based on a historical review of average tank levels between June 1 and September 30 for representative years between 1987 and 2004. Water demands on the transmission system were based on a review of turnout meter readings from July 2003. Model calibration was performed using data monitored and recorded by the water transmission automated data collection system between 2003 and 2004. The model is continuously updated as new data becomes available.

Model simulations were performed for a peak 168 hour (7 day) demand period for the following years: 2005; 2009; 2010; 2011; 2012; 2013; 2014; 2015; 2016; and 2017. Based on an analysis of historic annual demands between 1987 and 2004 shown in Figure 5, the Water Agency anticipates that the 75,000 acre foot per year Wohler/Mirabel diversion/re-diversion limit specified by its water rights is likely to be reached in about 2017. The 7-day period for the model simulations was chosen because historical data indicates heat waves in the Agency's service area seldom last longer than 7 days.

Key Assumptions

Significant assumptions made in the analyses are discussed below.

Transmission System Water Demands

Predictions of future year peak demands were estimated using a linear interpolation of the trend for the average peak 30-day demands for years 1987 through 2004 (Figure 5). The 7-day peak demand period used for future year model simulations was estimated by increasing the 30-day peak demand for each future year by an average of five percent. The five percent increase was based on a comparison of peak 7-day and peak 30-day demands recorded from 1987 through 2004. In order to account for daily fluctuations, a daily demand pattern was superimposed over the 7-day simulation. Figure 6 shows the demand pattern used during the simulation of the 7-day peak demand period. The analysis assumed that current operational practices by the Agency's contractors will continue and no additional measures would be taken to reduce demands from the transmission system during the 7-day period.

Modeled Transmission System Projects

The modeling simulations were performed using only the existing transmission system facilities and planned future facilities including: (1) Collector No. 6; (2) Wohler-Forestville Pipeline; (3) Kawana Reservoir No. 2; and (4) Eldridge-Madrone Pipeline. Construction and operation of these planned facilities is permitted by the Writ of Mandate discussed in Section 6 below, and the facilities are all anticipated to be completed by 2005. As discussed below, construction of certain additional facilities would avoid the near-term water delivery problems predicted by the modeling.

Annual Demand & Peak 30 Day Demand: 1987 - 2004 Sonoma County Water Agency

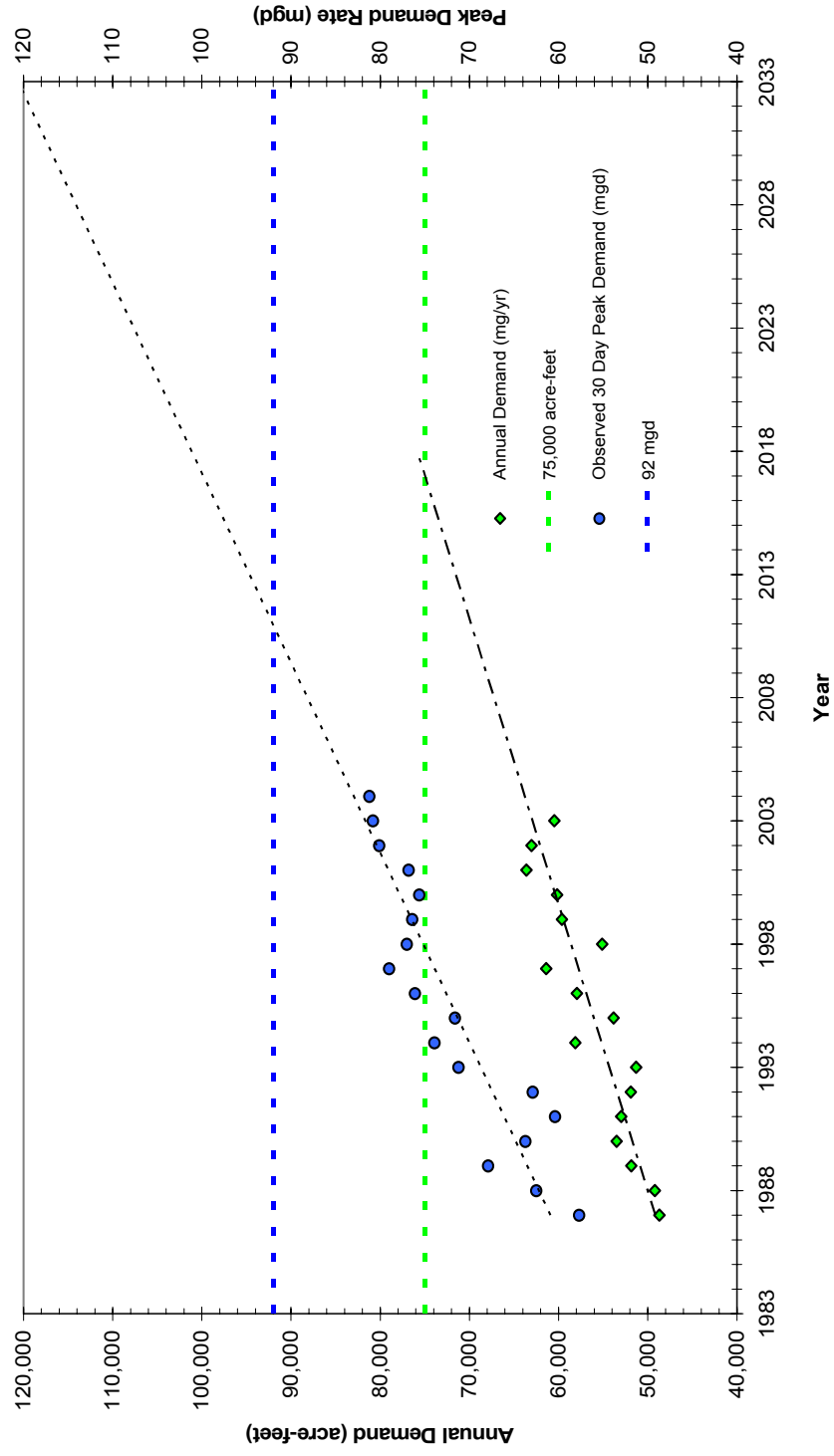


Figure 5: Annual and Peak 30-day Demand

Seven Day Peak Demand Pattern

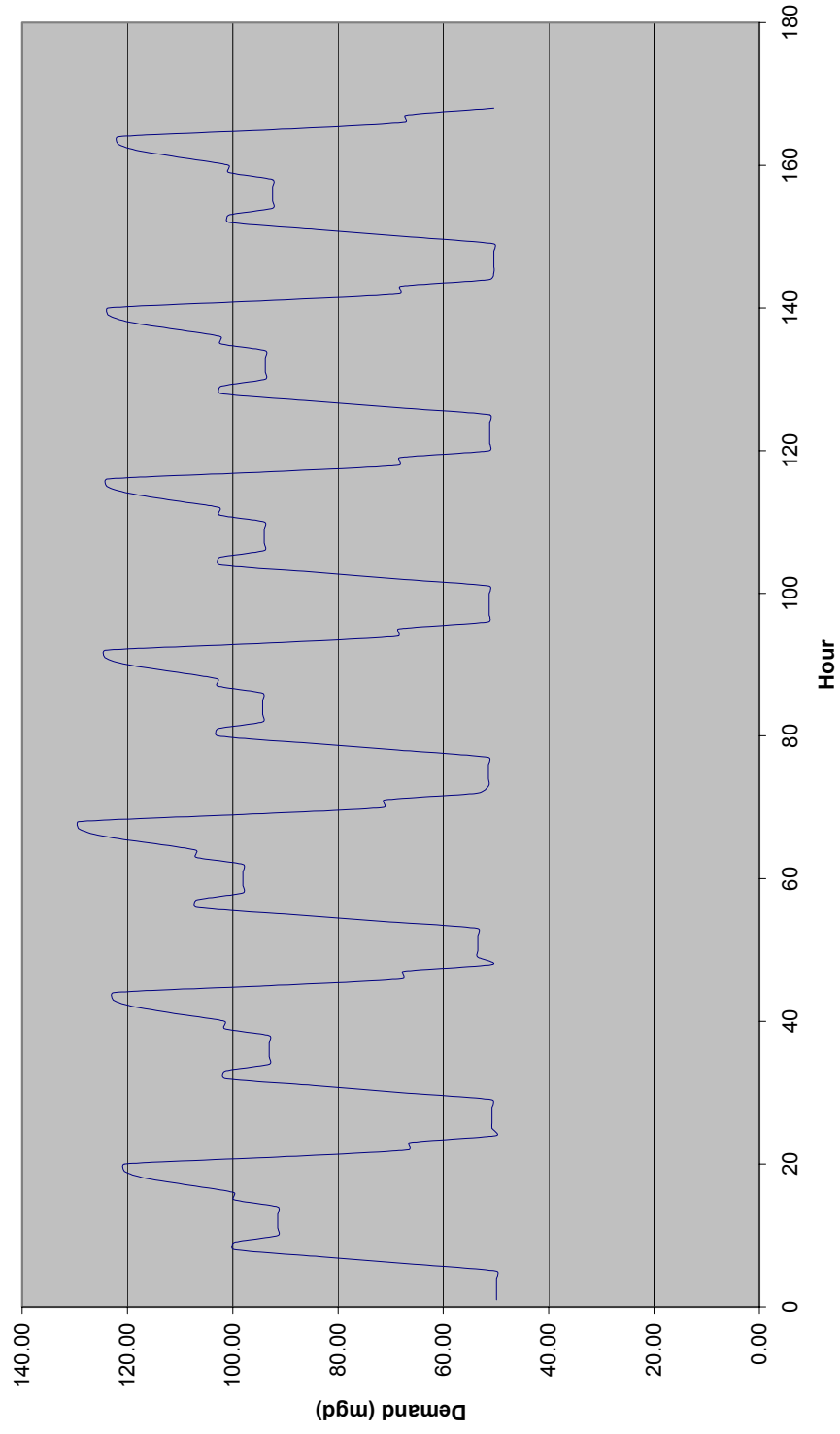


Figure 6: Seven Day Peak Demand Pattern

Model Simulation Results

In general, the analysis predicts that three sections of the transmission system will be unable to provide a reliable water supply for the periods analyzed. These sections are the Ralphine Storage Tanks, Sonoma Storage Tanks and the Kastania Storage Tank (Figure 2). The water-level decline over time for each of these storage facilities and the percentage of transmission system water demand that would need to be offset by other sources of water available to affected water contractors and customers (i.e., water conservation, recycled water and/or local groundwater) to maintain adequate water levels in the transmission system and prevent a loss of system pressure are discussed below for each facility.

Ralphine Storage Tanks

By 2009, the Ralphine storage tanks are projected to experience a significant decline during a 7-day peak demand period. Storage capacity is predicted to decline below 50 percent within 90 hours (approximately four days) and to 35 percent at the end of the 7-day period. As expected, the rate of storage depletion increases each consecutive year beyond 2009. Figure 7 shows the modeled water storage (as percentage of capacity) for the Ralphine Storage Tanks over a 7-day (168 hour) peak demand period for years 2005, 2009, 2012, 2015 and 2017. When model simulations of the water transmission system are run, Agency staff applies a standard that all of its storage tanks remain at approximately 50 percent full during the simulation period. This is a reasonable standard for the Agency's transmission system as it allows for adequate flows and pressures to meet daily demands. This standard also allows the Agency to, in the modeled simulations, have adequate water available for fire fighting and disconnect situations (about one half day's worth).

In order to maintain the Ralphine tank levels at least 50 percent of capacity, water demands from the transmission system in eastern Santa Rosa (east of the Ralphine Tanks through to Oakmont) and from Sonoma Valley users would have to be reduced through conservation or by use of other non-transmission system sources. This reduction in transmission system demand is in addition to the transmission system contractors' and customers' use of non-transmission system water sources during current periods of peak demand. The required demand reduction is estimated to be approximately 1.5 million gallons per day (mgd) in 2009 increasing to 5.8 mgd in 2017. These figures reflect a 10.5 to 40.6 percent reduction from the projected demand used in the modeling. Figure 8 shows the predicted demand reduction needed for years 2005, 2009, 2012, 2015 and 2017.

As discussed in Section 6, Agency staff is evaluating potential transmission system projects to alleviate this issue and to increase the reliable operation of the Ralphine Tanks. However, due to uncertainties regarding how quickly the Agency will be able to proceed, Santa Rosa, Valley of the Moon Water District, and the City of Sonoma and other customers in the affected area must be prepared to significantly reduce their demands during a 7-day heat wave so that water levels in the Ralphine Tank levels will be maintained.

Ralphine Storage Tanks
Percent Storage During 7 Day Peak Demand Period

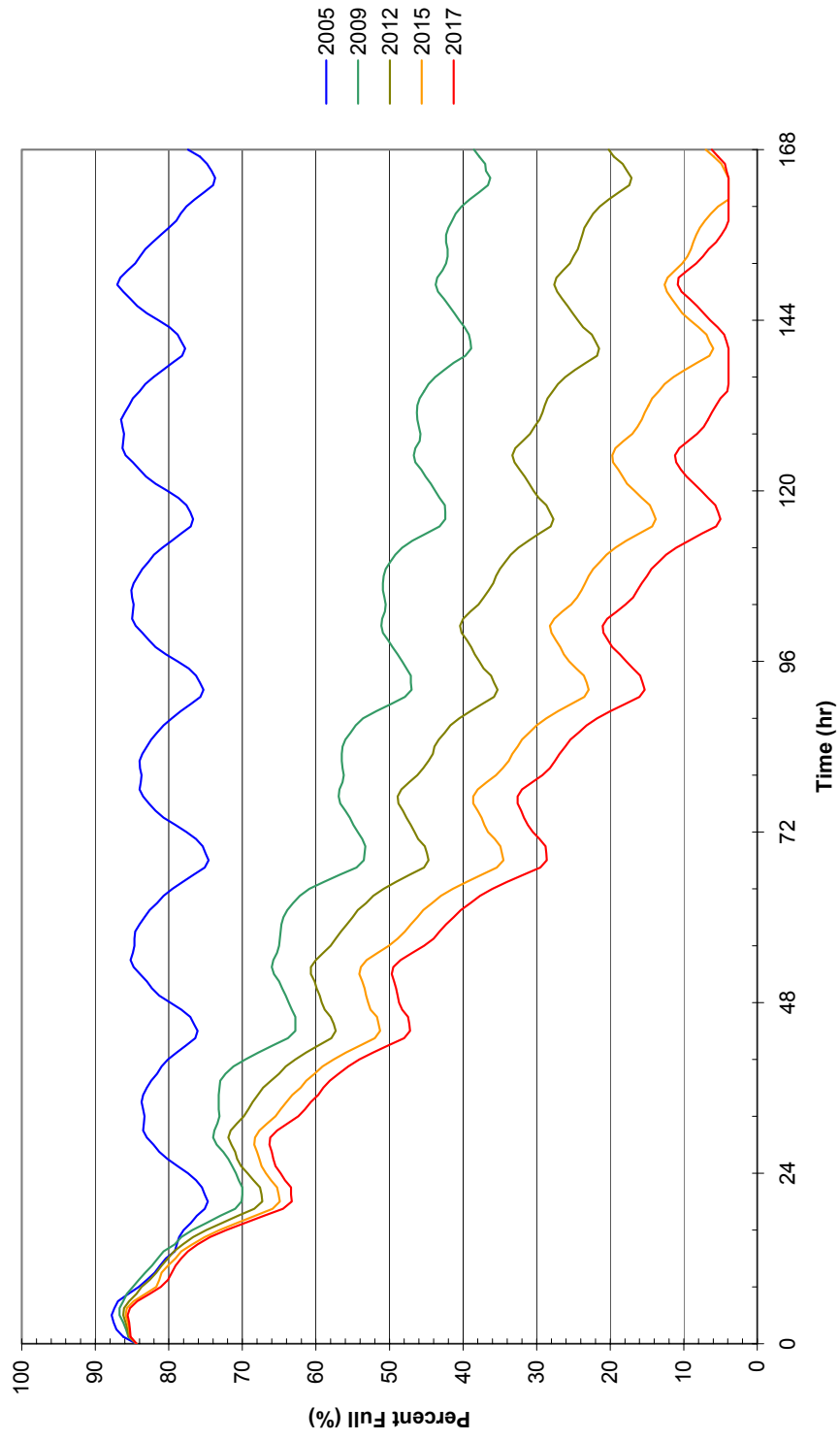


Figure 7: Ralphine Storage Tanks During 7-day Peak Demand

**Water Needed from Alternative Sources to Maintain
Storage Tank Levels Above Fifty Percent Full**

Ralphine Storage Tanks - Eastern Santa Rosa/Sonoma Valley Users
(This offset is in addition to other water sources being used to meet existing demands)

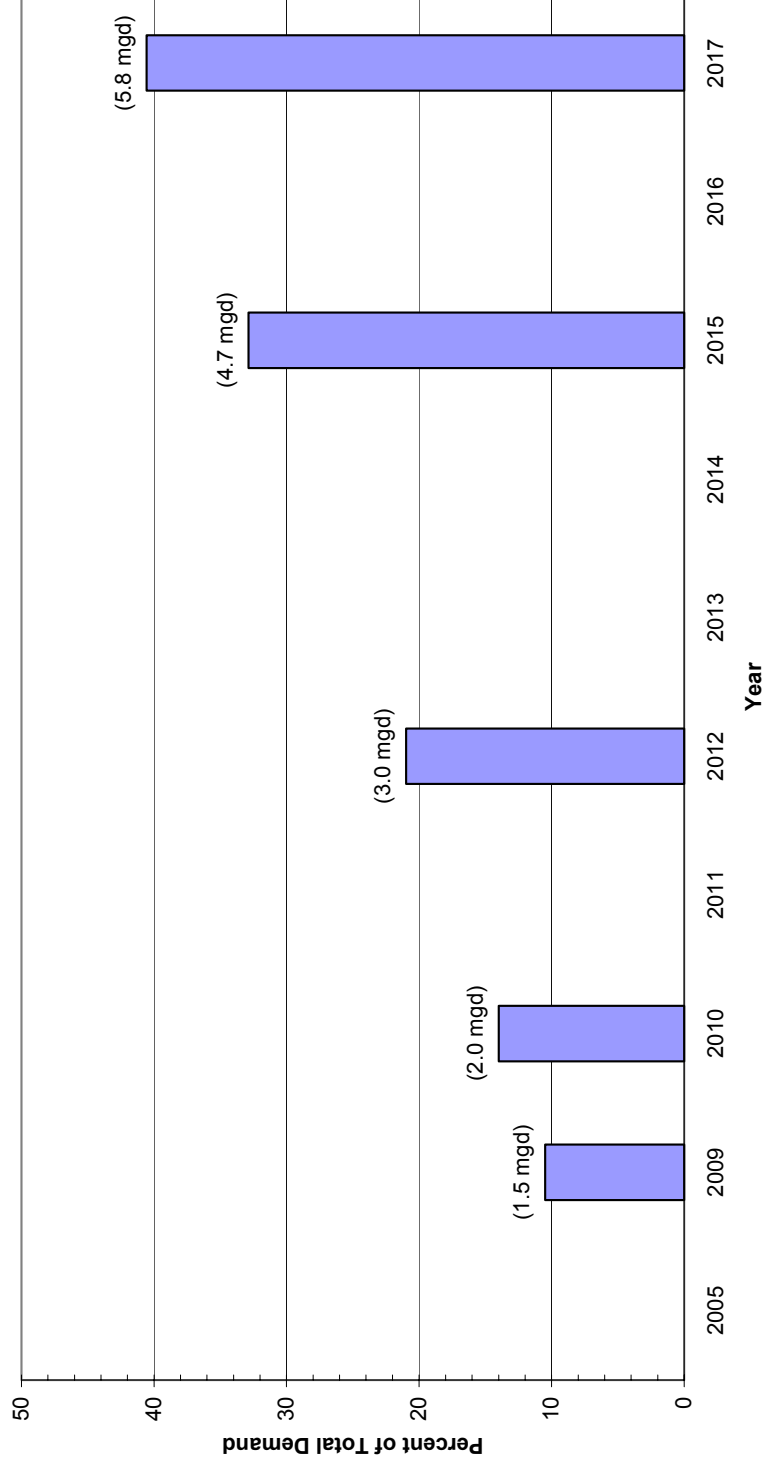


Figure 8: Ralphine Storage Tanks- Water Needed to Maintain 50% Capacity

Sonoma Storage Tanks

By 2009, the Sonoma Storage Tanks are also projected to experience a significant decline during a 7-day peak demand period. Storage capacity is predicted to decline below 50 percent within 90 hours and to 23 percent at the end of the 7-day period. The rate of storage depletion continues to increase each consecutive year. Figure 9 shows modeled water storage (as percentage of capacity) for the Sonoma Storage Tanks over a 7-day peak demand period for years 2005, 2009, 2012, 2015 and 2017.

In order to maintain Sonoma Tank levels of at least 50 percent storage capacity, water demands from the transmission system by Valley of the Moon Water District and City of Sonoma will have to be reduced by conservation or use of other non-transmission system sources. This reduction is estimated to be approximately 0.5 mgd in 2009 increasing to 1.7 mgd in 2017. These figures reflect a 5.3 to 15.6 percent reduction from the projected demand used in the modeling. This reduction in transmission system demand would be in addition to the demand reduction necessary to maintain water levels in the Ralphine Tanks discussed above. Figure 10 shows the predicted offset needed for years 2005, 2009, 2012, 2015 and 2017.

As discussed in Section 6, Agency staff is evaluating potential transmission system projects to alleviate this issue and to increase the reliable operation of the Sonoma Tanks. However, due to uncertainties regarding how quickly the Agency will be able to proceed, Valley of the Moon Water District and the City of Sonoma must be prepared to significantly reduce their demands during a 7-day heat wave so that water levels in the Sonoma Tank levels will be maintained.

Kastania Storage Tank

By 2005, the Kastania Storage Tank is projected to experience a significant decline during a 7-day peak demand period. Storage capacity is predicted to decline below 50 percent within 88 hours and to 40 percent at the end of the 7-day period. The rate of storage depletion continues to increase each consecutive year. Figure 11 shows the modeled water storage (as percentage of capacity) for Kastania Storage Tank over a 7-day peak demand period for years 2005, 2009, 2012, 2015 and 2017.

In order to maintain Kastania Tank levels at least 50 percent storage capacity, water demands from the transmission system by North Marin Water District and MMWD will have to be reduced by conservation or use of other non-transmission system sources. The necessary reduction is estimated to be approximately 0.5 mgd in 2005 increasing to 3.4 mgd in 2017. These figures reflect a 2.6 to 17.7 percent reduction from the projected demand used in the modeling. Figure 12 shows the predicted offset for years 2005, 2009, 2012, 2015 and 2017.

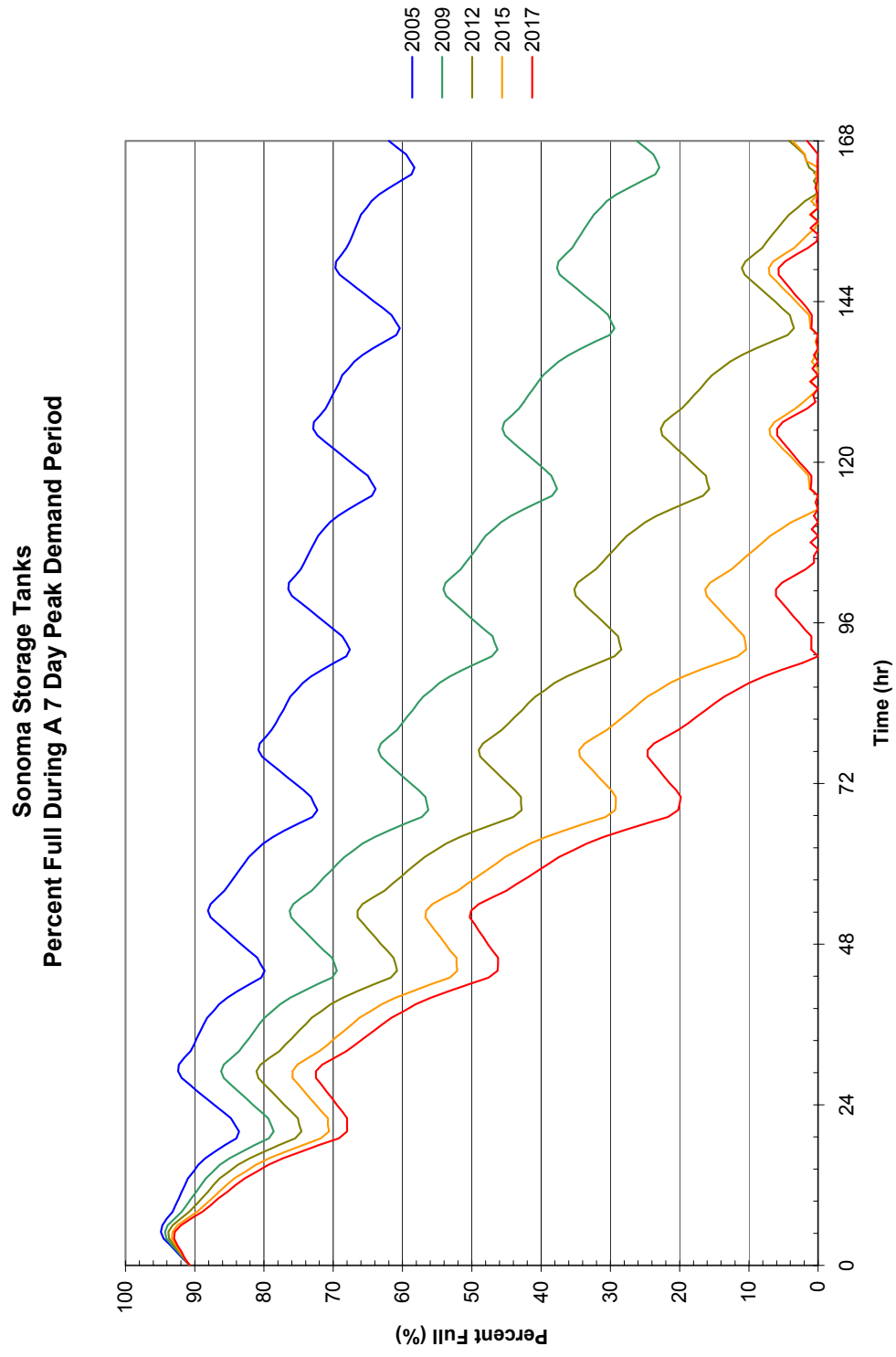


Figure 9: Sonoma Storage Tanks During 7-day Peak Demand

**Water Needed from Alternative Sources to Maintain
Storage Tank Levels Above Fifty Percent Full**

Sonoma Storage Tanks - Valley of the Moon/City of Sonoma
(This offset is in addition to other water sources being used to meet existing demands)

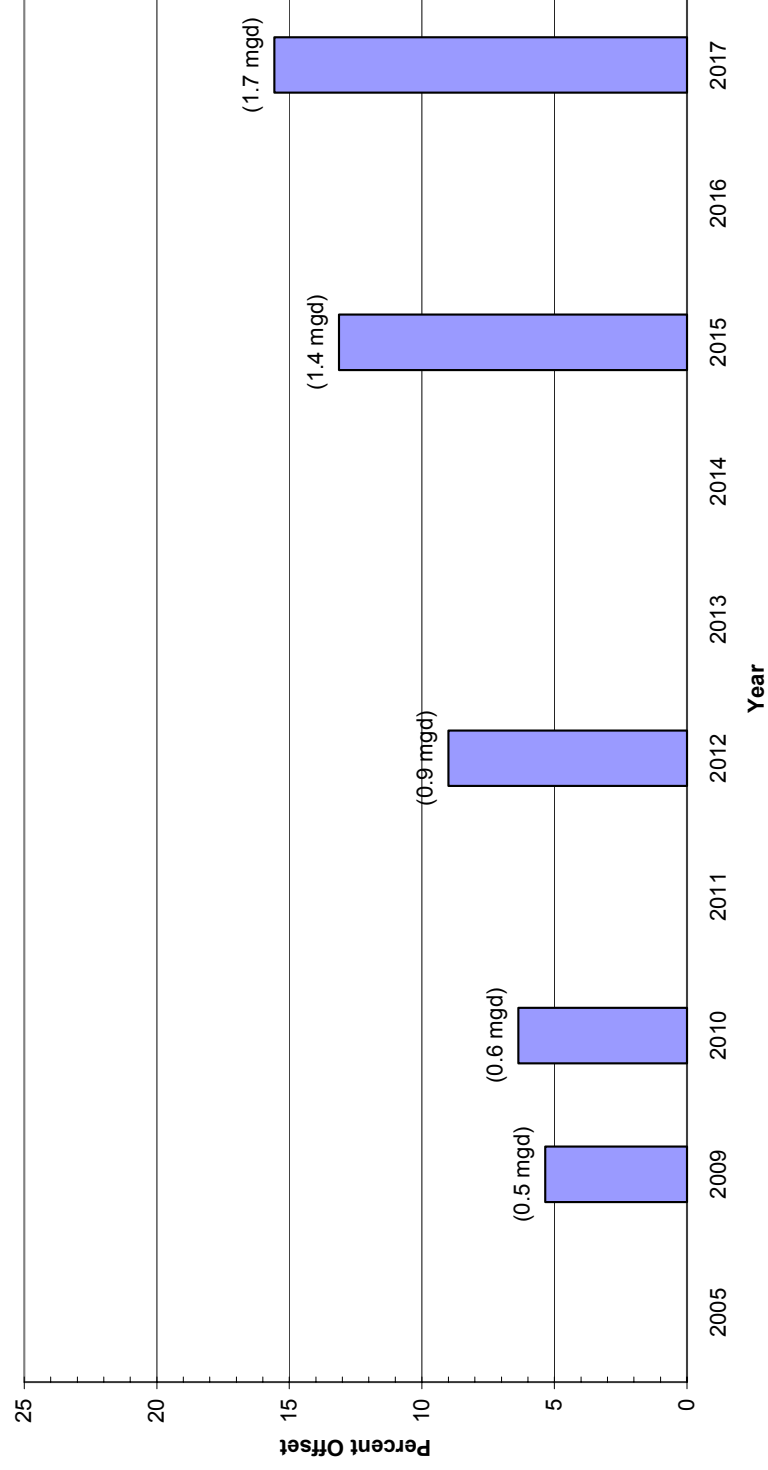


Figure 10: Sonoma Storage Tanks- Water Needed to Maintain 50% Capacity

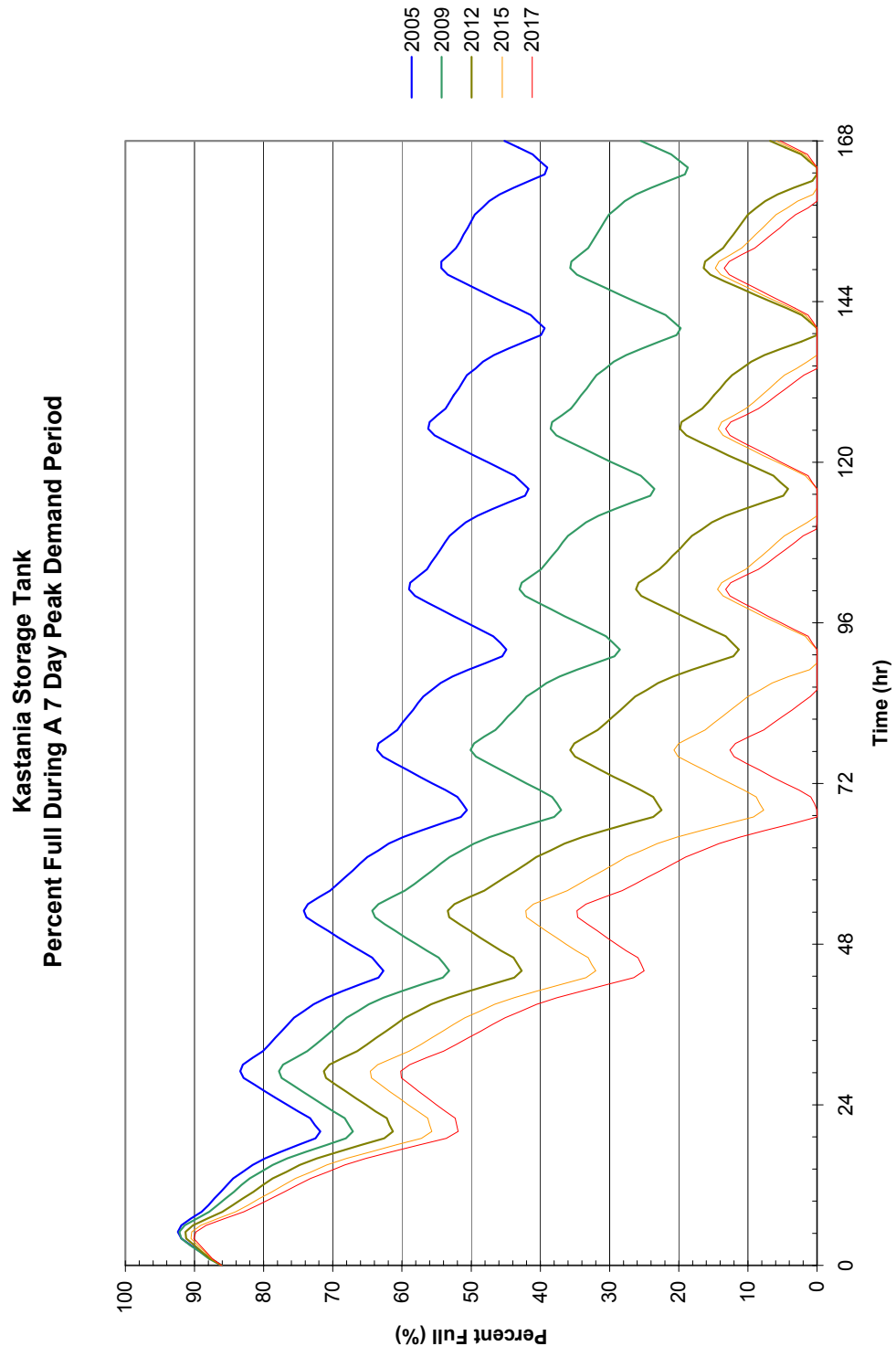


Figure 11: Kastania Storage Tanks During 7-day Peak Demand

**Water Needed from Alternative Sources to Maintain
Storage Tank Levels Above Fifty Percent Full**

Kastania Storage Tank - NMWD/MMWD

(This offset is in addition to other water sources being used to meet existing demands)

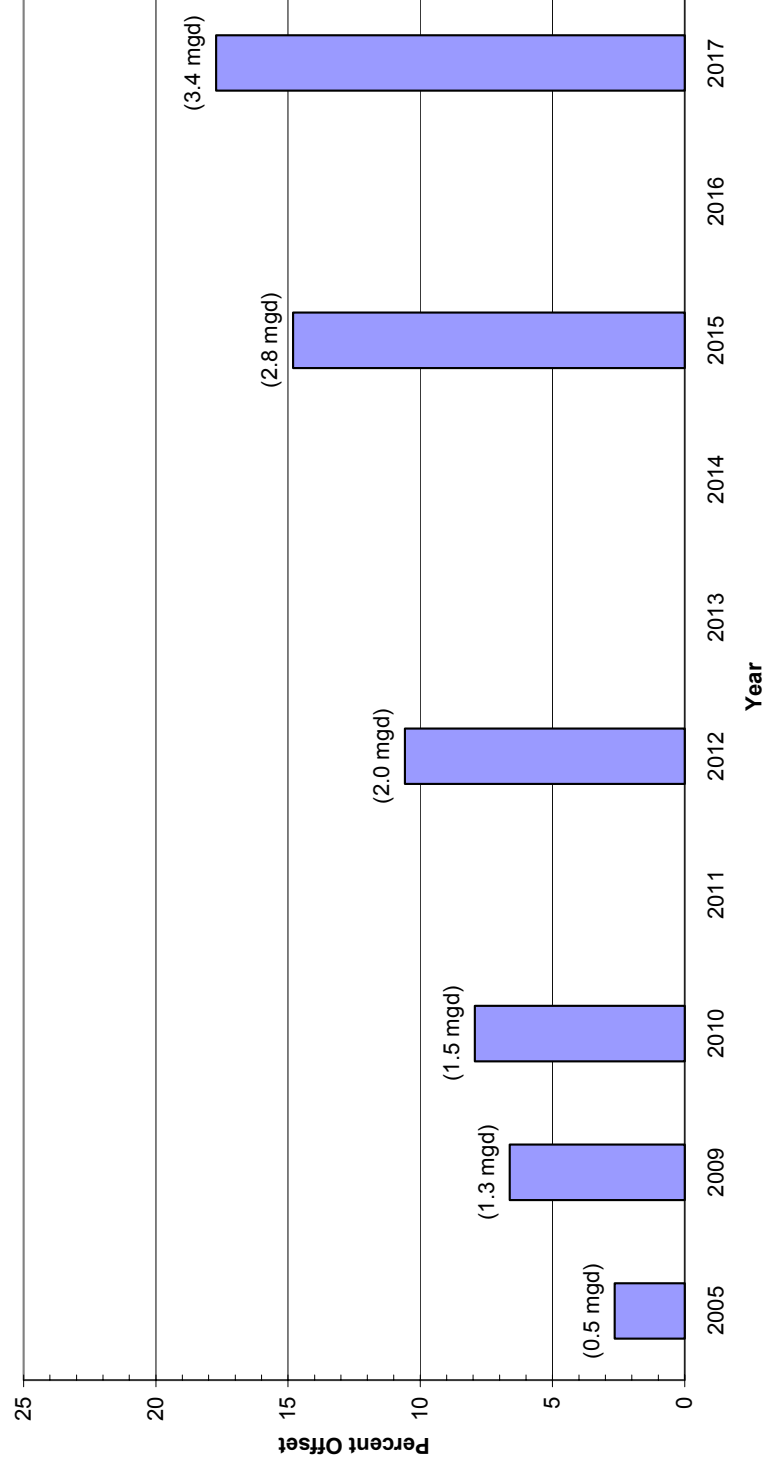


Figure 8: Kastania Storage Tanks- Water Needed to Maintain 50% Capacity

As discussed in Section 6 below, Agency staff is evaluating potential transmission system projects to alleviate this issue and to increase the reliable operation of the Kastania Tanks. However, due to uncertainties regarding how quickly the Agency will be able to proceed, Petaluma, North Marin Water District and MMWD must be prepared to significantly reduce their demands during a 7-day heat wave so that water levels in the Kastania Tank levels will be maintained.

Future Analysis of the Transmission System

Agency staff will continue to refine this analysis of the transmission system by (1) incorporating the updated water demand projections that will be developed as part of the 2005 Urban Water Management Plan update to more accurately represent planned growth within the Agency's service area; and (2) evaluating conditions for the entire June through September period. The new projected demands could form the foundation for a new Water Project EIR, as is discussed and recommended in Section 6 below.

6. New Water Project EIR

As discussed in Section 5, water demands within the Agency's service area are currently approaching the physical limits of the transmission system, and will likely reach the limits of the Agency's water right permits by 2017. Planning to resolve these constraints began over a decade ago, and the need for a new water supply project has become more critical as the years have passed. As discussed below, Agency staff proposes to prepare a new Water Project EIR. This work will be a top priority for staff. Although the preparation of a new EIR may take longer than preparation of a Supplemental EIR, as previously directed by the Board, the resulting document will be much easier for the public, other decision-makers, and the Board to understand and use because it will analyze the project and related issues, which are numerous and complex, in a cohesive manner based on current circumstances.

Water Transmission System Project Background

In May 1992, the Agency's Board directed preparation of an EIR for the expansion of the Agency's water supply system with the objective of providing a safe, economical, and reliable water supply to meet the defined future needs in the Agency's service area. The Water Supply and Transmission System Project EIR was prepared and was certified in November 1998, and the WSTSP was approved in December 1998.

After approval of the WSTSP, a lawsuit successfully challenged the adequacy of the WSTSP EIR and in May 2003, the Court of Appeal, in *Friends of the Eel River v. Sonoma County Water Agency*, identified specific deficiencies in the WSTSP EIR, and remanded the matter to the Sonoma County Superior Court for further action. In December 2003, the Sonoma County Superior Court issued a Writ of Mandate directing the Agency to vacate certification of the WSTSP EIR, rescind approval of the WSTSP, and prepare and certify a supplemental EIR to address the deficiencies identified by the Court of Appeal. The Writ of Mandate did not require that the Agency vacate its certification of the WSTSP EIR to the

extent that the EIR related to certain specific project facilities that the Superior Court ruled could be constructed.²

A Supplemental EIR

On April 6, 2004, the Agency's Board adopted Resolution No. 04-0285, vacating the portions of the previous resolutions that certified the WSTSP EIR and approved the WSTSP. The Board also directed the Agency's General Manager/Chief Engineer to prepare a supplemental EIR to the WSTSP EIR that addressed the deficiencies identified by the Court of Appeal. Consistent with the Writ of Mandate, the resolution did not vacate certification of the WSTSP EIR for the specific project facilities that the Superior Court ruled could proceed.

In May 2004, the Agency released a *Notice of Preparation (NOP) of Supplemental EIR for the WSTSP: Litigation, Project Updates, Changes in Circumstances and New Information*. The Agency received comments from sixteen entities and individuals. Some common themes were echoed by many commentors: demand updates should be based on current general plans (rather than those in effect in the 1990s), additional water conservation measures (reflecting progress in water conservation technologies) should be evaluated, impacts of Eel River diversions should be evaluated, the Agency's ongoing Section 7 consultation process should be discussed, and recycled water and wastewater projects that have occurred since the WSTSP was approved in 1998 should be discussed. Many comments also questioned whether a Supplemental EIR was appropriate, given the range of topics needing to be addressed. Agency staff also identified other difficulties as they began to prepare to draft a Supplemental EIR. For example, the original WSTSP EIR consisted of 8 volumes, many of which would need to be updated, presenting potential for significant difficulty during drafting and confusion during the public review process.

A New Direction for the Water Supply Project

Based on comments received in response to the NOP of the Supplemental EIR and events that have occurred since the WSTSP was approved in 1998, the General Manager/Chief Engineer recommends that the Agency prepare a new EIR that will provide the public and decision-makers with an environmental document that not only addresses the deficiencies identified by the Court of Appeal, but also more closely reflects the Agency's and its customers' current water supply circumstances.

The objective of the new project would remain similar to that identified in 1992—to provide a reliable water supply for future needs in the Agency's service area. However, over the intervening twelve years, the need for some project components (for example, facilities to ensure that the Agency's Ralphine, Sonoma, and Kastania storage tanks operate reliably during periods of peak demand) has grown more urgent. In some cases what was a future need is now a current need. Therefore, the project objective would be

² Specific project components that may proceed prior to the certification of a new EIR are Collector No. 6, Kawana Springs Tank No. 2, Eldridge-Madrone Pipeline, Wohler-Forestville Pipeline, and a portion of the Kawana-Ralphine Pipeline.

updated to “provide a safe, economical, and reliable water supply to meet the defined current and future water supply needs in the Agency’s service area.” The project would also be expanded to include a reliability component with the purpose of providing facilities needed to increase the reliability of the existing and future transmission system, particularly to address the storage tank level issues noted previously, and to address any modifications or additions suggested by the natural hazard study. To reflect the reliability component, the project will be called the “Water Supply, Transmission, and Reliability Project” and referred to as the “Water Project.”

New Demand Analysis

The Board recently directed the Agency to update the water contractors’ projected demands in conjunction with the preparation of the Urban Water Management Plan 2005. These new projected demands will assume 7500 acre-feet per year of savings by the contractors, as discussed in Section 7 below. The demands will form the foundation for the Water Project, and the demand analyses will be updated and incorporated into the new Water Project EIR. The updated demands will reflect current general plan projections, water use patterns, and savings from water conservation measures and recycled water use.

Incorporation of Site-Specific Project Analysis

Over the past several years, agency staff has made significant progress in preparing the site-specific environmental document for the WSTSP facilities collectively known as the South Transmission System Project (STSP). The Agency released an NOP, received scoping comments, and has completed site-specific surveys and much of the analysis. Staff expects to merge the STSP site-specific information into the Water Project EIR, so that site-specific review for those proposed transmission system facilities will occur at the same time as the program-level review for the Water Project. Site-specific information for additional facilities may also be included, for example for facilities to respond to the 7-day peak water demand problem or the natural hazard study as discussed in Section 5 above.

Schedule for New EIR

The Water Project EIR would be prepared in accordance with the California Environmental Quality Act, the State CEQA Guidelines, and the Agency’s Procedures for the Implementation of CEQA. A new Notice of Preparation would be issued within the next few months, and scoping meetings would occur during the public review period for the NOP. It is anticipated that a Draft EIR would be released for public review by May 2006, after completion of the Urban Water Management Plan 2005. A Final EIR would be completed by May 2007, and EIR certification and project approval could be considered by the Board by the early summer of 2007.

7. Water Supply Agreements

Eleventh Amended Agreement

The Agency delivers water from the water transmission system to its eight primary water contractors under the Eleventh Amended Agreement for Water Supply. The Eleventh Amended Agreement became effective in 2001. The Eleventh Amended Agreement provides for the finance, construction, and operation of diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. The Eleventh Amended Agreement also specifies the maximum amount of water the Agency is obligated to deliver from the transmission system to its customers, and sets forth a mechanism for allocation of water in the event of a deficiency in the amount of water available for diversion from the Russian River or in the event of a temporary impairment of the capacity of the transmission system. The Eleventh Amended Agreement also authorizes the Agency to construct the facilities previously contemplated in the WSTSP, although construction of any future authorized facilities would require compliance with CEQA.

The Eleventh Amended Agreement also requires the water contractors to implement or use their best efforts to secure the implementation of urban water conservation BMPs as established by the California Urban Water Conservation Council; or implement or use their best efforts to secure the implementation of alternative water conservation measures that secure at least the same level of water savings. The Agency and the water contractors must also implement or use their best efforts to secure the implementation of any water conservation requirements that may be added as terms or conditions of the Agency's appropriative water-right permits or licenses, or with which the Agency must comply under any applicable regulation or law.

Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment

In 2001 the Agency and its largest customers entered into the "Memorandum of Understanding Regarding Water Transmission System Capacity Allocation During Temporary Impairment" (MOU). The MOU followed a declaration by the Agency's Board of Directors in 1999 that the capacity of the transmission system was temporarily impaired and limited to 84 mgd. Significant components of this MOU include: (1) allocation of production capacity during the summer; (2) agreement that water conservation funds could be used for water conservation measures, recycled water projects, and standby local peak month production capacity projects that reduce peak demand on the system, and a funding support commitment by the Agency; (3) a requirement that contractors use best efforts to achieve standby local capacity equal to 40% of peak month demand, if feasible; (4) accelerated implementation of specific measures to alleviate summertime demands; and (5) an agreement to coordinate with agencies with planning and zoning powers as well as building regulatory powers for water supply planning purposes and promotion of water efficiency tools. The MOU expires on September 30, 2005.

Revised Temporary Impairment MOU

The Agency and its largest customers are negotiating a new Temporary Impairment MOU to take the place of the current MOU when it expires on September 30, 2005. Under the proposed new MOU, the customers will use their best efforts to limit deliveries from the transmission system to what can be reliably delivered during the summer months once Collector No. 6 and the Wohler-Forestville Pipeline are operational. The MOU also creates an team comprised of Agency and customer staff representatives, who will meet during times of high water demand to consider ways to reduce demand so as to not exceed the capacity of the transmission system. The new MOU has been largely negotiated, and Agency staff's goal is for the governing boards of the signatories to consider the MOU at the same time they consider adoption of the new Restructured Agreement for Water Supply. To facilitate adoption of the new MOU, Agency staff may ask the Board to declare a continued temporary impairment status on the Agency's transmission system.

Restructured Agreement for Water Supply

For the past several years, Agency staff and representatives of the water contractors and other major customers have been negotiating a proposed new water supply agreement, called the Restructured Agreement for Water Supply (Restructured Agreement). The Restructured Agreement will, if approved, replace the Eleventh Amended Agreement for Water Supply. The Restructured Agreement contains a number of significant provisions:

- The Restructured Agreement creates a Watershed Planning and Restoration sub-charge, which would be collected as a part of the Operations and Maintenance Charge. The Agency would use revenues from this charge to carry out fishery restoration and enhancement and environmental compliance activities reasonably necessary to permit the Agency to deliver water to its customers, and to undertake other watershed restoration projects or studies approved by the Water Advisory Committee. The charge would be capped at \$35/acre-foot for the first five years. The charge would assist the Agency in providing an adequate water supply by providing funds to ensure compliance with its obligations under the federal Endangered Species Act and other environmental laws.
- The Restructured Agreement requires contractors to use their best efforts to implement local supply and recycled water projects that will reduce demands on the transmission system by 7,500 acre-feet/year in ten years. One half of this reduction is targeted to be met by recycled water projects. The Restructured Agreement also incorporates and makes permanent the specific water conservation requirements now contained in the Temporary Impairment MOU, including making it "highly desirable" that the water contractors achieve and maintain standby local production capacity of approximately 40% of peak demand.
- The Restructured Agreement creates specific sub-charges to fund recycled water projects, local supply projects, and water conservation projects that are approved by the Water Advisory Committee. Such projects may be developed, owned, and operated by the water contractors.
- The Restructured Agreement changes the methodology contained in Section 3.5 of the Eleventh Amended Agreement, which governs allocation of water during a

supply shortage or a temporary impairment of the transmission system. The proposed change would recognize the water conservation, local supply, and recycled water efforts of contractors, and would not penalize during a shortage those contractors whose deliveries from the transmission system are already less because of such efforts. The Agency would also be required to provide examples of how water would be allocated under various shortage scenarios, so that customers would have a more definite idea of the amount of water that would be available to them in such scenarios.

- The Restructured Agreement adds specific process and criteria by which the Agency would analyze and consider requests from water contractors for increases in annual delivery limits, and coordinates that process with the Agency's Urban Water Management Planning process.
- The Town of Windsor becomes a water contractor, and Forestville becomes an "other Agency customer." Windsor would pay a premium for 15 years in order to offset the capital contributions to the transmission system previously made by the other water contractors, and would also pay various sub-charges (including the Watershed Planning and Restoration Sub-Charge) on water it diverts under its own water rights using its own facilities. In the event of a shortage of water available for diversion from the Russian River, Windsor would share water it diverts using its own facilities and water rights with other water contractors. Forestville would receive certain existing facilities, would be guaranteed a certain amount of water in the event of a shortage, and the cost of an additional pipeline to Forestville would be paid by the water contractors.

In addition, the Restructured Agreement contains a number of changes that would benefit the Agency and the water contractors. These include (1) updates to the financing provisions of the Eleventh Amended Agreement, to give the Agency greater flexibility in financing improvements to the transmission system; (2) imposition of a sub-charge to pay for the Agency's costs of preparing a regional Urban Water Management Plan every five years; (3) elimination of provisions relating to revenue bonds that have been fully paid; (4) definitions of "entitlements" and "entitlement limits" to better reflect the meaning of those terms within the existing and proposed agreement; and (5) establishment of a "Technical Advisory Committee" consisting of appointees of the water contractors, to discuss water conservation and other technical/engineering issues relating to the transmission system.

Negotiations on the Restructured Agreement are nearing completion. Outstanding issues remaining to be negotiated include the specific language for allocating water during periods of shortage as set forth in Section 3.5 of the Restructured Agreement, the process for increasing water contractor annual delivery limits as contained in Section 1.6 of the Restructured Agreement, and limitations on the Watershed Planning and Restoration Sub-Charge. As soon as these issues have been resolved, individual contractors will take the agreement and Revised Temporary Impairment MOU to their various Boards and Councils for consideration.

The Restructured Agreement is a significant part of long-term regional water supply planning. It contemplates the more active commitment on the part of the water contractors to continue and expand local supply, recycled water, and conservation projects, in order to reduce demands on the transmission system, especially during peak

demand periods. It will also provide the Agency with additional financial resources necessary to meet the water supply needs of its customers and the Agency's obligations under the federal and state Endangered Species Acts and other environmental laws.

Secondary Water Supply Agreements

In addition to the Eleventh Amended Agreement and the MOU, the Agency is negotiating or expects to bring to the Board for consideration amendments to several other water supply agreements. These include modifications to MMWD's (MMWD) agreement and changes to agreements with "other Agency customers."

Marin Municipal Water District

In 1975, the Agency entered into an agreement with the MMWD that provided for the delivery of water to MMWD not to exceed an annual amount of 4,300 acre-feet, using excess capacity in SCWA's transmission system available during the off-peak months of the year. The water was conveyed to MMWD's distribution system via the North Marin Aqueduct pursuant to a wheeling agreement between MMWD and North Marin Water District. Agreements with MMWD were modified a number of times, the last being 1996, when SCWA entered into a Supplemental Water Supply Agreement with MMWD. These modifications progressively increased the total quantity of water allocated to MMWD, expanded the time frame for deliveries, required MMWD to pay charges in lieu of property taxes to supplement the Russian River Projects Fund, and required provisions for MMWD to make payments in return for certain firm rights to stored water in Lake Sonoma.

The Agency staff is currently negotiating with MMWD to modify the existing agreements. Under the current agreements, MMWD must determine by July 1, 2005 whether or not to pay approximately \$6 million to obtain the right to an additional 5,000 acre-feet of firm capacity in Lake Sonoma. Under the amendment being negotiated, MMWD and the Agency would agree that MMWD could wait until 2014 to make this election. In exchange, MMWD would agree to pay the new environmental sub-charge contemplated by the proposed Restructured Agreement, and confirm its obligation to fund a portion of the South Transmission System Project. Additionally, the new amendment would cap the price of water sold to MMWD at \$500 per acre-foot for the first five years.

Other Agency Customer Agreements

In addition to the Eleventh Amended Agreement, the Agency has agreements with "other Agency customers." These include the Town of Windsor, the County of Sonoma, California-American Water Company (Larkfield/Wikiup), Lawndale Mutual Water Company, Kenwood Village Water Company, Penngrove Water Company, the City of Sebastopol, the State of California, and Santa Rosa Junior College. The Eleventh Amended Agreement limits the amount of water the Agency can deliver from the transmission system to "other Agency customers" to an average of 2.7 mgd in any month. These customers are also subject to "peaking" limitations contained in the water service rules adopted by the Board in 1998 that preclude them from taking significantly greater amounts during the peak months than they take during other months.

Staff and County Counsel are researching whether any “other Agency customer” is violating the peaking limitations. Reducing “other Agency customer” peaking will reduce overall demands on the transmission system during the summer months. In addition, although as noted above there is an overall limit on the amount of water the Agency can deliver to “other Agency customers” as a group (2.7 mgd), there are no limits applicable to each individual “other Agency customer.” Agency staff plans to renegotiate the “other Agency customer” agreements or propose amendments to the Agency’s water service rules that will provide limits for each such customer.

“Russian River Customer” Agreements

The Agency also has contracts with a number of public entities that allow the entities to divert water directly from the Russian River under the Agency’s water rights. These customers include the City of Healdsburg, the Town of Windsor, the Russian River County Water District, Camp Meeker Recreation and Park District, and the Occidental Community Services District. These “Russian River Customers” divert water using their own facilities. If adopted, the Restructured Agreement will require the Agency to use its best efforts to amend these agreements to impose certain additional charges on Russian River Customers.

Redwood Valley County Water District

The Agency is currently negotiating an agreement with the Redwood Valley County Water District that would authorize Redwood Valley to pump up to 3,000 acre-feet per year of surplus water from Lake Mendocino under the Agency’s water-right Permit 12947A. Such pumping would be authorized only during times when Redwood Valley may not pump water under either its own water-right Permit 17593 or under water-right Permit 12947B of the Mendocino County Russian River Flood Control and Water Conservation Improvement District, and when the water is not needed by the Agency. The agreement would require Redwood Valley to provide the Agency and the Mendocino County Water Agency with daily logs and annual reports listing the amounts of water pumped from Lake Mendocino under Permits 17593, 12947B, and 12947A.

Payments for the water that Redwood Valley pumps under the Agency’s water-right permit would accumulate in an account that would be used for water conservation, water recycling, and fisheries enhancement projects and programs in Mendocino County. The Mendocino County Water Agency and participating water districts in Mendocino County would decide how to spend money from this fund, but the Agency’s General Manager/Chief Engineer would have to approve each expenditure.

The agreement would require Redwood Valley and all other participating water districts in Mendocino County to become members of the California Urban Water Conservation Council and to implement feasible urban and agricultural water conservation measures.

Dry Creek Landowners

The Agency is negotiating an agreement with landowners in Dry Creek Valley represented by a nonprofit corporation called “Dry Creek Agricultural Water Users Inc.”

This corporation represents much of the irrigated land in the Dry Creek Valley. The agreement is intended to facilitate coordination of water use in the Dry Creek Valley, evaluate the feasibility of using recycled water to offset potable use, and provide access to Dry Creek for collecting fisheries and hydrological data. Clearly identifying when and how much water is used for agriculture in this area will greatly assist the Agency in planning releases from Warm Springs Dam to maintain water supply while optimizing fisheries habitat in Dry Creek. The proposed agreement is anticipated to be completed in the next six months.